# Macul Standard Control of the Contro

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# Plus:

- How to Live with ATM
- 4th Dimension vs. Omnis 5
- Charting-Software Roundup
- Kawasaki's Apple Secrets

# **Hot Reviews:**

DesignStudio • RagTime DiskTop • MicroPhone II Cordless Tablet • Theorist Monster 37" Color Display and much more!



# Microsoft Excel and Word now with built-in mail support.

If you're using Microsoft® Excel or Word, it's now possible for your entire department to work together without having a get-together.

Just add Microsoft Mail.

Doing so will add years to the life of your company's carpet. And, perhaps more importantly, allow you to accomplish tasks that were previously impossible with *any* E-mail system.

Suppose, for instance, that you're preparing a report in Word. Because it features built-in Mail support, you can zap the report throughout your entire workgroup via Mail. Without ever leaving your program.

And without losing formatting.

Then, if those receiving your report are in Word, they can access your document with one keystroke, digest it, add pertinent info, even attach suggestions for changes. And spit it right back to you without leaving their program.

Now if you think that's whiz-bang, get this: When you combine Microsoft Excel with Mail, you can do much more than share spreadsheets. Thanks to Microsoft Excel's built-in macro language, you can do things like write your own macro to receive, process, and fulfill orders. All

without utilizing a single iota of manpower.

And that's just one fine example of how Microsoft Excel and Mail let you consolidate and distribute data across a network automatically. Even if you have both Macintoshes and PCs.

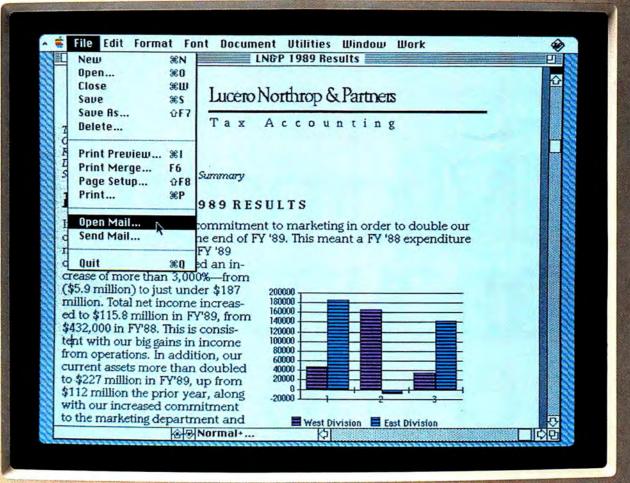
Now that we've covered a few of the unique ways that Microsoft Excel, Word and Mail work together, we'd like to add one more point. We design all of our applications with one goal: To continually exploit the Macintosh's capabilities in ways that profoundly promote productivity. And, of course, keep users attached to their chairs.

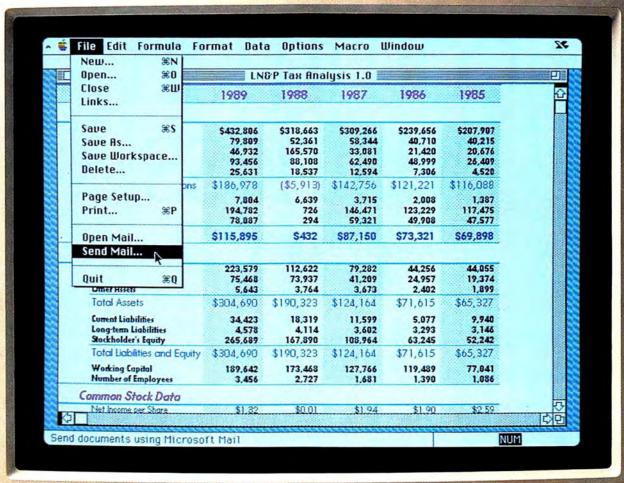
For more information on how to keep

your hallways clear, just call us at (800) 541-1261, Department K68. And while you're at it, ask us about The Microsoft Office—four of our best-selling business applications at an astonishingly affordable price.



Microsoft
Making it all make sense





# Microsoft announces an end to the second most common business trip.



# MacUser

### StartUp

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BY STEVEN BOBKER

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**Pinstripe Picks 46** BY ROBERT R. WIGGINS Button-down products for business users. GCC's WriteImpact handles multipart forms with panache. Page-layout program Multi-Ad Creator is designed for designing ads. FlowMaster makes media flowcharting easy. Plus Tefax, NewsTrack, MediaMap, and the hefty Encyclopedia Macintosh.

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**Managing Adobe Type** Manager

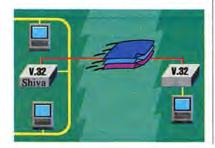
BY SALVATORE PARASCANDOLO

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As System 7 draws ever nearer, it's time to think seriously about the O word - obsolete. What will it

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BY THOM HOGAN

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BY BOB LEVITUS Got a problem with your Mac? Dr. Macintosh tells

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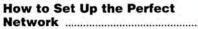
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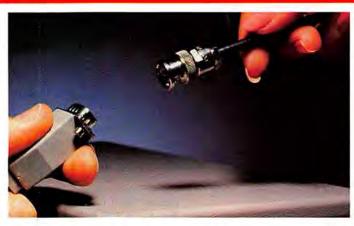
Mac networks are getting bigger all the time, but that shouldn't mean that you have to compromise on performance. Avoiding network gridlock demands careful planning. Here's an

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### 

BY KEE NETHERY AND THE

MACUSER NETWORKSHOP STAFF

If you want to connect to Ethernet, choosing the right router can significantly affect performance results. MacUser Labs tested five router models to see which were the fastest, the most consistent, and the best values.

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Jeffrey Miller

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### Product Announcements and Updates

MacUver is always looking for new and unusual products for our StartUp, Power Tools, Bridges, and DTP sections, as well as for feature coverage. If you've got a product that you'd like to tell us about — whether it's new or an upgrade send your letters or press releases to Michele Stokol, Editorial Assistant, MacUver, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

### Technical Difficulties and Help

Although we can't offer any telephone assistance, MucUser welcomes your technical questions. If you've got a Mac question or problem, send it to Help Folder, e/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. If we can't give you an answer, we'll find someone who can. Because of the volume of mail we receive, we can't answer all your questions, so we also recommend that you take advantage of your local user groups. You can find the one nearest you by calling Apple toll-free at (800) 538-9696, ext. 500.

### Tips, Hints, and Programs

Hps, Hints, and Programs
We love to get fips and hints (on a disk, please)
from our readers. Any tips should be sent to Tip
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Floor, Foster City, CA 94404. We can't print
every tip, but we try our best to pick the most
interesting and representative ones for publication. We'd also like to heat from any programmers who are interested in contributing to our
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# THE PLANE'S NOT TOO SHABBY EITHER.

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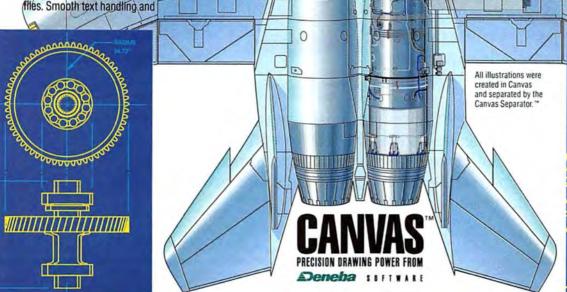
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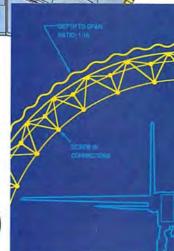
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- e. your finance package
- c. your word processor
- f. your network software

Easy Color Paint 1.1 is a versatile 256-color paint program with over 17 tools, multiple color palettes, user-defined patterns, blends, fonts, brushes, color printing—all you need to discover the artist within! Runs on all Mac II's, also the Plus, SE and Portable. Priced at \$79. See your dealer, or call us at 1-800-367-6899. Visa/MC.



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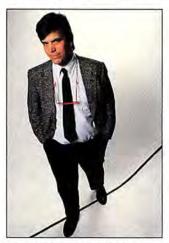
# **On-Line with Zmac**

ometimes you can tell as much about a magazine by what its readers say as you can by what's between its covers. Lately our readers — that's you — have had a lot to say. It hasn't been the usual collection of letters, phone calls, and veiled threats, though. This response has come through E-mail sent to our Download Area on CompuServe.

The Download Area began as a vehicle for delivering programming code for readers of Kurt Matthies and Thom Hogan's Power Programming column. In addition to being able to download the files, readers had the opportunity to send us feedback on

the idea of a MacUser online service. We received responses as varied as our readership. But one clear thread echoed throughout the messages: Give us more.

Lance Moody, also known as ID #72750,1571, wrote, "This is a nice feature from your magazine. I look forward to seeing this area grow." Henry O. Compton, who travels the nets as 71210,1041, had this to say: "I have been waiting for MacUser to appear on-line like PC Magazine. How about putting an index on here someplace?" Alan Touchberry, alias 71061,2716, said, "It would be nice if



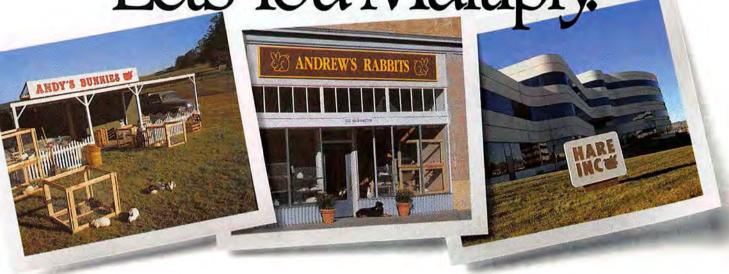
On-line manager Ben Templin (72511,35) is developing a service that will function as an electronic extension of *MacUser*.

we could provide feedback to the editors of *MacUser*." Tom Wernsman, who resides at 71170,2606, wondered, "Can we upload proposed articles to this area?"

The answer to all these questions and requests is: yes and more. Sometime in May, you'll be able to type GO MACUSER from CompuServe and enter a full-fledged on-line service developed by on-line manager Ben Templin. Ben's well-known to Mac-magazine readers as the former editor-in-chief of the late *MacGuide*, and he's done stints at *MacUser*, both in print and, now, in electronic form. Joining us in this on-line venture is our sister publication, *MacWEEK*, the No. 1 newsweekly for industry professionals. We'll be operating under the name Zmac—a reference to our parent company, Ziff-Davis Publishing.

Future issues of MacUser will describe the service's offerings in detail. In the meantime, here are some highlights: a product database that contains more than 1,000 entries, a tech-support area that gives you expert support when you need it most, an editors' forum where you can talk with (or back to) the folks who put this publication together, a software-download library that offers only the best in shareware, plus the full text of every issue of MacUser and MacWEEK.

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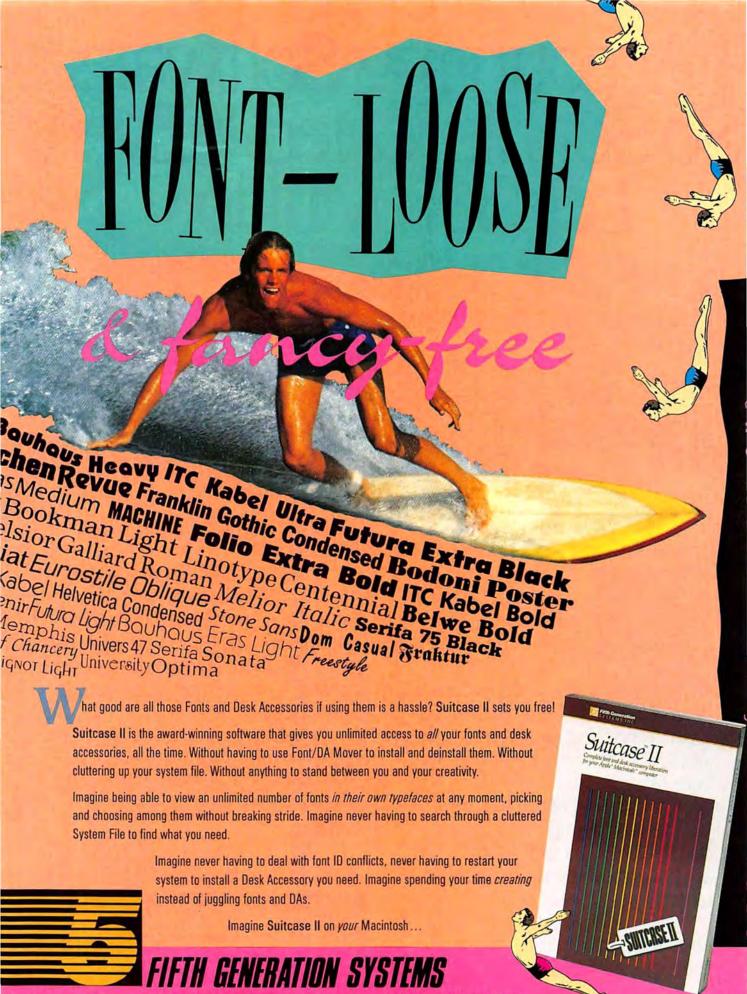
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# **LETTERS**

COMPILED BY JAMES BRADBURY

### Sic Humor

While Guy Kawasaki's evaluation of the approximate locus of Machiavelli's thinking ("Macintosh Business Administration," March '90, page 33) is perhaps valid, I imagine he meant annals instead of anals. On the other hand, why is he grinning so?

### W.Y. Brown Savannah, GA

We stand by our proofreaders. Guy says that everyone who thought it was a typo should sell their Macintosh and buy an IBM PC. — JB

### Free-For-All

I loved Guy Kawasaki's column on trade shows ("Fair Trade Laws," April '90, page 33), especially the part about "how to get free stuff." However, I've one question for Mr. Kawasaki: If you tell everyone else that Claris and Microsoft have given you samples, then what do you say to people at the Claris and Microsoft booths?

### Jared Hertzberg Norwood, NJ

If you have to ask, you don't deserve free software. — GK

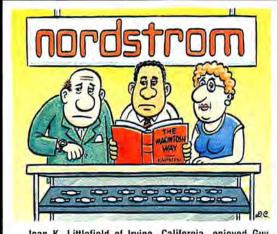
### **Poles and Checks**

The letter from Greg Lindenberg, of the Gazeta, Warsaw, Poland (Letters, February '90, page 10), may be the most important composition you have ever published. Apple, Aldus, Adobe, and all the others have been telling us for six years how great all this technology is and have made enormous profits from all the hype. Now is the time for those people to put some money where their mouths are.

James F. Martin Roanoke, VA

### **A Taxing Situation**

You gave five mice for MacInTax



Joan K. Littlefield of Irvine, California, enjoyed Guy Kawasaki's April "Mission: Impractical (Jokes)" so much that she was inspired to contribute a prank of her own: Victim: Guy Kawasaki

Title: Resident MacUser smart aleck

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at Nordstrom's to remotivate their employees in The Nord-

For best results, be sure to wait until next April 1 — and (shhh!) don't anyone tell Guy!

("Tax Reformers," March '90, page 138)? Your reviewer failed to mention that MacInTax has two "releases" — one in early January and the other . . . well . . . later. On this, the last day of February, I still have not received Release 2 of the program, which is supposed to contain forms vital to any tax practice.

In short, with half of the tax-preparation season gone, I'm hobbled with half a software program. (That may sound balanced, but anyone in business knows otherwise.)

### Hile Goodrich Arvada, CO

The review stated, "SoftView plans to release MacInTax in two phases, and by the time you read this, only the first phase may be available." According to the company, Phase 2 was sent out to registered users beginning February 17.

— JB

### **ATTO Boy**

When I received the February '90 issue of MacUser, I was immediately curious about your lead article, which was described as a laboratory test of "101 Hard Disks." The cover promised that I would discover the "fastest disk money can buy."

Not so. The best hard drives you tested demonstrated average seek times of 18 msec. My MicroNet SB-330 hard drive provides 321 megabytes of storage with a seek time of 11 msec.

### Steven E. Nissen, M.D. Lexington, KY

Hey, Doc, hope you read the covers of your medical journals more carefully than you do ours. "The Fastest Disk Money Can Buy" referred to our review of the ATTO SiliconDisk on page 70 of the February issue. It claims an access speed of .05 msec—about 220 times faster than your hard drive.— JB

### Catch a Rising Star

As the first recipient of the Derek Van Alstyne Rising Star Award, I find it encouraging that the industry chooses to recognize the small developer. I believe that this award will encourage struggling programmers worldwide.

I'd like to thank all the registered Stuff-It users who have supported me over the

past years of development and who have provided me with numerous suggestions and feedback. I hope that I can continue to develop software that will be of use to everyone in the future. I would also like to offer my special thanks to Richard

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# **ANOPENER DELIVERS**



We like to think of CanOpener as the information retrieval utility for the Mac. Because it lets you search and retrieve text, pictures and sounds from just about any Macintosh

file; then view, save, print or copy the information you need.

But it seems our users have other ways of describing CanOpener, such as "..useful", "..a lifesaver" or (our current favorite) "..the neatest thing since peanut butter!"

And some of the toughest critics of all, the editors of MacUser magazine, recently awarded CanOpener their prestigious Editors' Choice Award for Best File-Management Utility.

So, no matter how we describe CanOpener, one thing is clear, it's solving our customers' information retrieval problems. And in our opinion that makes CanOpener just one thing ... a success!

CanOpener. \$125. For more information, or to receive a free information package, call 800-552-9157 or 914-747-3116.

### **ABBOTT**SYSTEMS

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# LETTERS



Outerbridge for his help with the security features that gave StuffIt and StuffIt Deluxe the fastest and most se-

cure encryption engine available for the Macintosh.

Raymond Lau Cambridge, MA

### Spawning Crickets and Frogs

In an otherwise excellent review (Bobker's Dozen, March '90, page 40), Steven Bobker made an error regarding our mood-altering Synchronicity software. There is no "shareware version" of this product. We don't believe in shareware; it usually lacks integrity and, as a marketing approach, almost always fails. We do believe in sharing, however, and encourage our customers to share demo copies of Synchronicity, which the program itself can "spawn" with its Fresh Copy function.

Paul O'Brien, president Visionary Software Portland, OR

### One Bad Apple . . .

Paul Somerson's "Apple-Basher Bashing" editorial (March '90, page 23) failed to address the underlying reasons for Apple's recent

difficulties. Essentially, Apple has concentrated almost exclusively on targeting its Macintosh toward business while simultaneously neglecting its historically significant personal-computer and education markets.

To overcome its present difficulties, Apple should seriously consider releasing a "bridge" machine that runs Apple Ile, Apple IIGs, and Mac software. That would enable Apple to unite its user bases into a cohesive group for the first time.

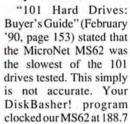
Kenneth C. Richardson Maple Glen, PA

### ... Doesn't Spoil the Barrel

Finally, someone has written an article (Paul Somerson, "Apple-Basher Bashing," March '90, page 23) in which Apple's strength is measured rather than its weakness exploited. Certainly the fact that Apple makes \$5 billion per year must mean that at worst it deserves an A-minus in marketing and product success.

Charles A. Kolbe Cherry Hill, NJ

### Speed Check



seconds. Our tests of the same drive with DiskBasher! showed 67.5 seconds set



### Special Delivery . . .

 Hard luck, Apple. After the company girded its loins and slashed the list price of

its CD-ROM drive by 25 percent, it turns out that price wasn't what was keeping most of our correspondents from taking the plunge. "Believe me, it's not the player but the lack of interesting CDs that's making the difference," writes John R. Sachs of Petaluma, California. John R. Robbins of Huntsville, Alabama, thinks that "some APDA software, Inside Macintosh, Macintosh owner/ user manuals, or other information on a CD-ROM disc with the drive would make it more attractive." In other words, something like Apple's developer-only Phil and Dave's Excellent CD-ROM — the coolest CD-ROM title that Apple won't sell you. Allan Bacon of San Diego, California, wants to see Apple "bundle some applications. A complete dictionary like the one that NeXT bundles

with its computer would be very useful." Are you listening, Phil and Dave? James Baker of Long Beach, California, would be easier to please: He wants to see "multiple versions of the Bible along with some related maps." Time for Apple to sponsor Oral and Billy's Most Excellent CD?

Apple's new System 6.0.5 now supports 16- and 32-bit-color icons. Word 4.0 lets you write in 8-bit color. The person next to you has a 32-bit-color startup screen of his dog. What's going on here? Color's making major inroads on the Mac, but who other than high-end DTPers really needs it?

### Speak Up: Color on the Mac — 2 gimmick or necessity

Send your thoughts to Special Delivery, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

# Now you can use old friends to access corporate data.

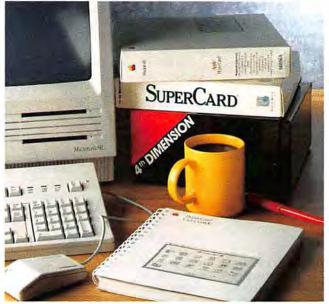
There you are cranking along at your desktop. Then it happens. You realize you need some critical data that resides on your mini or mainframe.

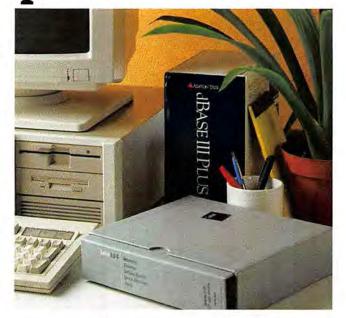
And you can't get it.

Unless of course you've got ORACLE. For the first time PC and Macintosh users can access ORACLE and IBM data from any of their favorite desktop applications.

You can query and update data on ORACLE, DB2, and SQL/DS databases, using the applications you know and love, including Lotus 1-2-3, 4th Dimension, Hypercard, Supercard and dBASE III Plus. Your entire company's wealth of information is available immediately. Without leaving the desktop.

With ORACLE for Macintosh, you'll be using one of the most popular user interfaces to access corporate data. Develop with the Macintosh Database Version for \$699. Or, you can have the Macintosh Network Station Version without the local ORACLE database for \$299. If you're a 4th





Dimension developer, connect with ORACLE for 4th Dimension, the easiest way to access corporate data through familiar 4D applications. Only \$199. And all of these access corporate data via Oracle's SQL\*Net, the \$299 protocoltransparent network solution.

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Give one of these ORACLE products a try for 30 days. Then, if you're not happy, send them back and we'll send you a full refund.

If you're not ready to give up on your old friends, there's only one thing to do. Call 1-800-ORACLE1, ext. 7669 now.



# The Original Developer of Stufflt Deluxe Died in 3712 B.C.



We'll let others argue over who invented which idea. We at Aladdin Systems know exactly where the inspiration for StuffIt Deluxe" comes from.

The ancient Chinese.

The Chinese language compresses words and phrases into simple pictorial characters. StuffIt Deluxe does the same to entire Macintosh files.

Huge files that once took up 1 megabyte of space now occupy as little as 16K. With StuffIt Deluxe, limited space is history,1,2



Deer Park Center, Suite 23A-171, Aptos, CA 95003 (408) 685-9175

1 For those already familiar with the ever-popular Stuffit," Stuffit Deluxe adds over 75 new features, including complete archive management (sorting, multiple windows, Finder-like operation, etc.), improved password protection, variable compression methods, scripting, virus detection, and one step QuickStuffQuickUnStuff menus. Added house: Two ViewIF. brand viewers. Call us for more info.
2 For the record, Raymond Lau, the modern-day inventor of Stuffit

Deluxe, is alive and well and believed living somewhere on the East Coast.

Stuffit is a trademark of Raymond Lau. Stuffit Deluxe is a trademark of Aladdin Systems, Inc. and Raymond Lau.

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## LETTERS

with a 1:1 interleave factor and, when using a 5:1 interleave factor, 189.1 seconds. Thus, it is our opinion that the drive in question was formatted and tested on a Mac Plus and then moved to an SE/30 for testing without being reformatted to optimize the interleave factor. MicroNet offers the MS62 as an entry-level system, and we know it is not the fastest system around, but it certainly is not the slowest.

### Charles F. McConathy, president MicroNet Technology, Inc. Irvine, CA

We retested the MS62 with the interleave set at 1:1 and came up with a DiskBasher! time of 37.5 seconds, which would have made the MS-62 the thirdfastest 60-megabyte drive in the review. We have no problem recommending this drive, especially considering MicroNet's excellent reputation for service and support (see Bobker's Dozen, May '90, page 40). — JB

### **Know Your Options**

Your March '90 issue has an interesting sidebar by Kristi Coale ("Eight Ways

alt

option

to Use the Option Key," page 205). Here are two additional uses that I didn't see mentioned:

· Holding down the Option key

while dragging a file into the Trash overrides any file lock or query from the system about really wanting to throw away an application.

. Holding down the Option key while dragging a file from one folder to another or to the desktop creates a copy of the file with the same name rather than just moving it.

**Burt Johnson** Berkeley, CA

### **More Options**

In the Finder, holding down the Option key while clicking on a window's close box closes all open windows.

After you quit an application, holding down the Option key closes all windows that were left open on the desktop before returning to the Finder.

### Whitney M. Johnson Lansing, MI

Actually, that story was originally called "18 Ways to Use the Option Key." Now let's see if you can find the other half dozen. - JB

### **Grouchy Marks**

Some of the limitations that Victoria von Biel cited in her review of our Mark Up text-editing software (StartUp, March '90, page 57), such as the need to save layers one page at a time, are actually due to the technical limitations of the Mac. Saving whole files across the network would bring even Ethernet to its knees.

MarkUp is a groupware program, and for a group of people collaborating on a document or an author reviewing several editors' comments, this interface is extremely useful. The ability to compare and merge the comments of other people is only one way in which MarkUp supports group interaction. Its built-in message and journal features are others.

MarkUp is a pioneering product in a brand-new category and needs to be reviewed as such.

### Lisa Hess, product manager Mainstay Agoura Hills, CA

Lagree that MarkUp is a ground-breaking product and deserves credit for innovation. Unfortunately, the drawbacks I

mentioned in my review severely limit its practical usefulness. Whether it's because of limitations in the software or in the Mac is beside the point if you're trying to do groupware work. - VvB

### Playing Standards

Thanks to John Rizzo for his honest article on CD-ROM drives ("Most Valuable Players," March '90, page 150). I've watched with dismay as the press proclaimed each year since 1983 "The year of CD-ROM."

CD-ROM is a classic example of inappropriate standards' causing more harm than good:

1. Set a standard in advance of required technology and market development.

2. Eliminate all competing technologies even if they work better.

3. Seven years later, wonder why nobody wants to buy it.

Mark Heyer Palo Alto, CA





# Apples Té Apples.

# How to connect any Macintosh computer to any Apple monochrome monitor...

### **Connect Apples to Apples**

As you can see, the *Publisher Series* video boards from Generation X allow you to connect any Macintosh computer to any Apple monochrome monitor. Nobody else can do that. Not even Apple!

And talk about comparing Apples to Apples; the *Publisher Series* video boards for the Mac Plus, SE, SE/30, Mac II family and the new Mac Portable all work according to Apple's specifications for quality and compatibility.

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### ...or Apples to Oranges

Now let's talk Apples to Oranges. The *Publisher Series* video boards will work with many monitors in addition to those from Apple — from 15" to 21". It's your pick.

So if you want to connect Apples to Apples, or even Apples to Oranges, pick the *Publisher Series* video boards.

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-MAC USER Jan'90

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# **LETTERS**

### **Back to Spool**



GCC's Personal LaserPrinter II, which won your 1989 Eddy Award for Best Monochrome Output Device (March '90, page 108), sounded so good that we decided to get one for our small business. Fortunately, I called GCC before placing our order. Here are some limitations the company told me about:

 You cannot spool to the PLP-II (contrary to your article), nor will GCC's QuickSpool help. The best you can do is hold printing until another time.

It prints edge to edge (per your article), but it can't print the top quarter inch on a sheet (not a big deal but certainly something that could "blindside" some buyers).

### Robert S. Wilks Loveland, OH

Technically speaking, you're correct; although the GCC Print Manager lets you defer printing, it does not operate in background mode under MultiFinder. — 17.

### **What Goes Around**

Thank you very much for giving an Honorable Mention of the Editors' Choice Award in the category of Best General Utility to Boomerang. Also, we were pleased that you kindly explained Boomerang in "Directory Assistance" (March '90, page 198).

Unfortunately, there's a mistake in the article: Boomerang 2.0 is described as freeware, but it is actually shareware. We distributed several beta versions of Boomerang for debugging purposes as freeware. Now that the program is fairly solid, we've started distributing Boomerang 2.0 as shareware.

Mana Yamamoto, president Hiroaki Yamamoto, programmer zeta soft Berkeley, CA

### The Correct Aperture

When we designed Aperture, we

examined the Macintosh drawing interface in detail. We deviated from it in places where it could not handle largescale, precision drawings containing thousands of objects. Whether they are drawings of office facilities, network diagrams, factory plans, engineering designs, or project- and work-flow diagrams, our users' drawings are often large and complex and need to be accurate. We created mechanisms that let them do this work faster and with less tedium. For example, we knew we had to implement a way to select objects in a complex drawing even when it was zoomed out. If you hold the mouse button down, Aperture highlights the element you would pick if you were to release the mouse button. In this way, you see the object you would pick before you actually pick it.

Nevertheless, some of the points raised in Steven Bobker's review of Aperture (StartUp, April '90, page 61) are well taken, and we are listening. In future versions, you can expect to see Aperture adhere more to the Macintosh interface without compromising the facilities that enable our users to create information applications.

Unfortunately, Mr. Bobkerdid not have enough space to fully describe Aperture's integrated database and no space to describe its symbol-library facilities or its abilities to link drawings, display text on the drawing from the database, and produce detailed or summary reports. It is these features that allow our users to build applications that enable them to see information in much more meaningful ways.

### Harold Feinleib, president Aperture Technologies, Inc. Stamford, CT

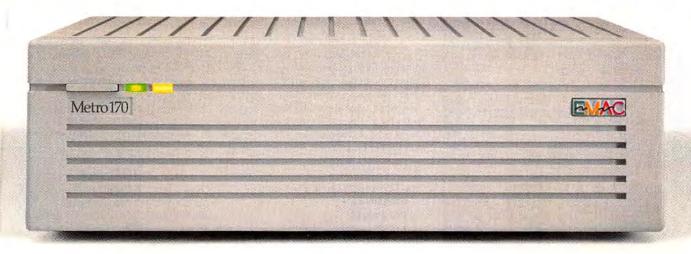
I agree that I looked at Aperture from the viewpoint of a strong proponent of the Mac interface. I felt it necessary to take that view since our readers cover a broad spectrum of users. Casual users will spend quite a while mastering this version of Aperture.

I'd like to reemphasize that although I can't highly recommend this version of Aperture, the potential is here for a truly outstanding program. After the modifications Mr. Feinleib talks about are made, I hope to review the program again. Those improvements should dramatically improve Aperture's rating.— SB

Also see "Clarifications" for some additional notes on our review of Aperture.

— Ed.

# It's like owning a disk drive with a bulletproof vest.



# Introducing the Metro with SCSI Sentry

EMAC has found a way to prevent unnecessary Macintosh hard drive fatalities with SCSI Sentry,"



an engineering breakthrough in disk drive reliability. It protects your disk drive from damaging shorts that can trap data inside your hard disk. Which makes any drive with the SCSI Sentry

substantially more reliable.

And only EMAC Metro drives have it.

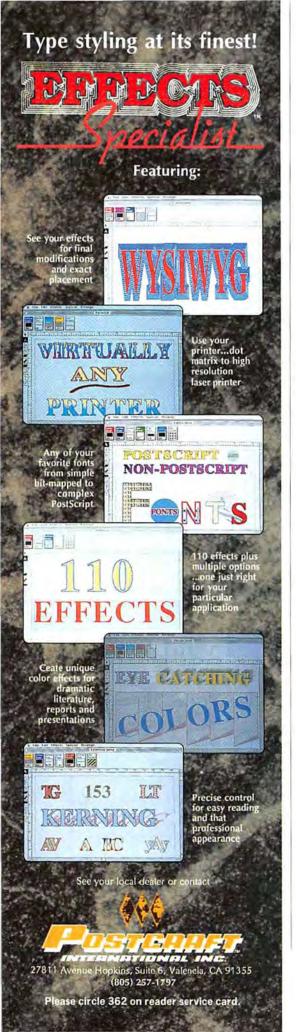
Metros are zero-footprint disk drives — so they fit perfectly under a Mac Plus or SE. You can also stand Metro on its side next to any Mac II, keeping your desk free for papers, phones, or photographs.

But Metro's engineering goes far beyond pure aesthetics. With some of the most stringent testing in the market — and mean-time-between-failures ratings of 50,000 to 70,000 hours — these drives were built to keep you up and running. And, if your Metro drive ever does have problems, our modular design makes diagnosis and repair quick and easy.

When you add the SCSI Sentry to such reliable disk drives, you know your data's safe with Metro. If you want to own a disk drive with a bulletproof vest, call EMAC at 1-800-821-0806, extension 2222. It's just one more way that EMAC gives you more for your Mac.

More for your Mac

EMAC, the EMAC logo, Metro, SCSI Sentry, and "More for your Mac" are trademarks of Everex Systems, Inc Other brand names, and product names are trademarks or registered trademarks of their respective companies. EMAC, a division of Everex Systems, Inc., 448-111 Milmont Drive, Fremont, CA 94538



# LETTERS

### Off with Her Head



MacUser's art director, Lisa Orsini, gives Eddy a trim.

That's quite a striking photograph on page 92 of the March '90 issue. There's nothing like opening a computer magazine and finding yourself face to face with someone's chest. Call me cynical, but when I see shots like that, I always wonder if the art director cut off the woman's head because he only had space for the *important* parts. Next time, would you please treat a picture of a human as if it were a picture of a human and include the face also? Even if it is a woman?

### Christina Cary San Jose, CA

Call us starry-eyed, but we wanted to draw attention to neither our model's head nor chest but to the Eddy award she was holding. Now, if she'd been able to balance it on her head . . . . By the way, why assume our art director is a man? It's news to Lisa Orsini, who's had the job since 1986. — JB

### Yesterday's CPUs

The only response I can think of for the letter "CPU Envy" from Mark R. Alley (April '90, page 14) is the old saw that "there are only two stages in the development of a new electronics product: prototype and obsolete." If he could buy it, it was already obsolete!

If Mr. Alley is so upset over this, let him ship his Ilex to me. I'm still struggling along at work and at home with Mac Pluses and could certainly use the extra speed.

John Davison Raleigh, NC

### Whine at Any Cost

I'm really sick of hearing all of these Macintosh owners whine about how their precious CPUs are "obsolete" months after they purchase them because Apple had the nerve to release a faster, more efficient machine. With this kind of mentality, we'd still be driving Studebakers and doing our computing on machines the size of Wyoming.

When will those whiners realize that successive technological developments will eventually make every model of every computer seem obsolete?

Daniel Buchan Carlisle, PA

### Mini Happy Returns

I must write to tell you how much I appreciate all the hard work you put into producing your quality magazine each month.

May I say how glad I am to see the MiniFinders back in their rightful place. I depend on them and your excellent product reviews for choosing nearly all my software.

Perhaps you could produce a catalog of all product reviews ever and the date of the magazine in which the review appeared? I know you already do this for the products listed in MiniFinders, but not all reviewed products are listed there. Over the months, some programs disappear. The catalog could be made available to readers on a disk. I would buy one!

### Bruce G. Hoag London, England

Although space doesn't permit including a MiniFinder for every product that
MacUser has ever reviewed, a more
complete MiniFinders HyperCard stack
is available through our download area
on CompuServe. Just type GO MACUSER
at any CompuServe prompt. For more on
what is and will be available on-line
from us, see this month's About MacUser.

— 1B

### Let Guy Be Guy

Your comments [which typically appear italicized and in brackets like this—Ed.] in the Guy Kawasaki [former Apple evangelist and ACIUS CEO, now a MacUser columnist—Ed.] column [probably referring to the April'90 issue, page 33, not to the other piece by the same author on page 36—Ed.] are intrusive [You don't mince words, do you?—Ed.]. Please stop.

### Charles Sax Portland, OR

No comment. - JZ

# When It Comes To Viruses, There's No Such Thing As Overprotection.



### **Introducing Symantec** AntiVirus for Macintosh (SAM<sup>™</sup>), Version 2.0.

The original version of SAM just locked up the 1989 Eddy as "The Best

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And more essential. Because, when your business is at stake, no amount

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SAM finds and destroys all known viruses and clones. It also protects you from new, unnamed viruses by constantly scanning for suspicious virus-like activity. And only SAM 2.0 protects you with instant virus updates from our exclusive 24-hour Virus Newsline.

To keep viruses from ever becoming a problem, SAM keeps them out. SAM prevents any infected application from launching and spreading a virus, and detects "Trojan Horse" attempts to damage a disk. It checks every floppy or removable you insert, and just touch a hot-key to check files downloaded from networks or by modem.

Total protection. It makes SAM the best-selling, highest rated antiviral program ever created for the Mac. So get new SAM 2.0 today and relax. Because, with SAM 2.0, viruses can come knocking. But they can't get in.

SEE YOUR DEALER, OR CALL FOR MORE INFORMATION: (800) 228-4122 Ext. 651F

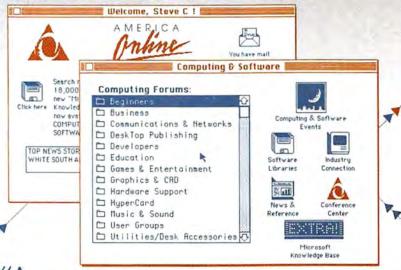
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-MacWorld



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—Guy Kawasaki

—MacUser

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## **LETTERS**

### Clarifications

### Return to Sender

The information at the end of the Address Book Plus review in Bobker's Dozen (April '90, page 38) was incorrect. The correct information follows:

Version 1.0. Requires System 6.0 or later. \$89.95; \$129.95 with leather binder. Power Up! Software, 2929 Campus Drive, San Mateo, CA 94403; (415) 345-5900.

The address for KeyPlan was listed incorrectly (StartUp, April '90, page 59). The correct address is Symmetry Software, 8603 E. Royal Palm, Suite 110, Scottsdale, AZ 85258; (800) 624-2485 or (602) 998-9210.

### **Corrected Test Results**

"101 Hard Drives: Buyer's Guide" (February '90, page 153) reported the Ehman 45 hard drive as having a DiskBasher! time of 90.4 seconds. After retesting at a 1:1 interleave, the Ehman 45 yielded a DiskBasher! time of 38.2 seconds.

The article also stated that the LaCie drives lacked FCC stamps. The LaCie drives do in fact have FCC approval but merely lack the stamp indicating that.

### Aperture

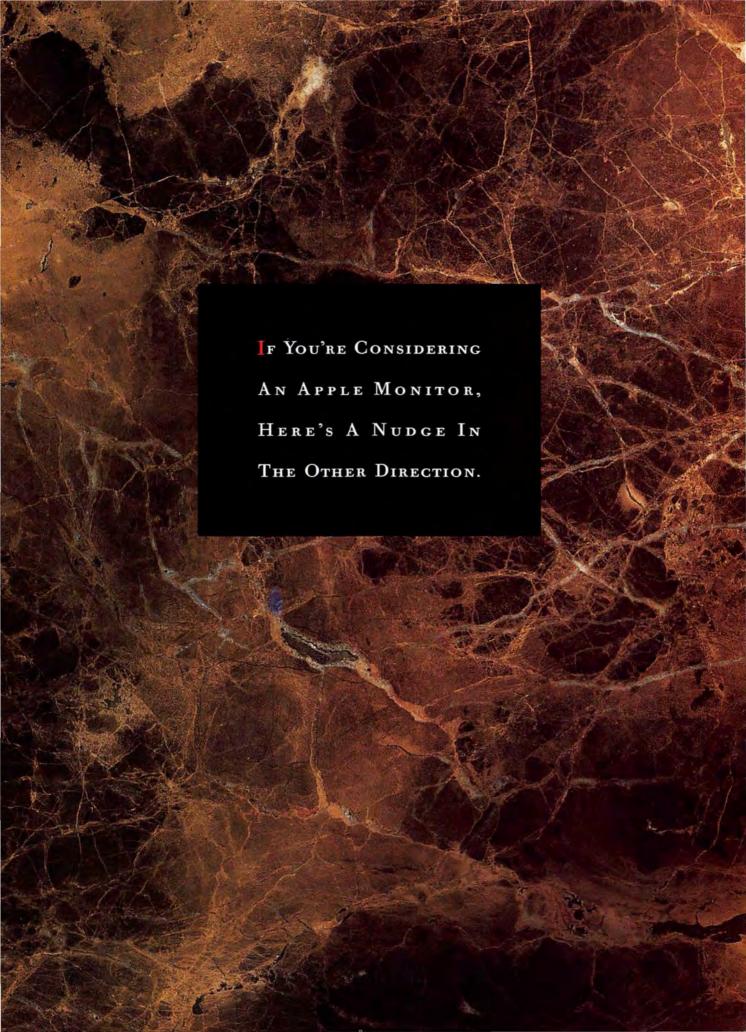
In the Aperture review (April '90, page 61), we said that there's "no scrolling in the sense that any other Mac program interprets that term." You can, in fact, scroll by using the mouse in combination with a keyboard command.

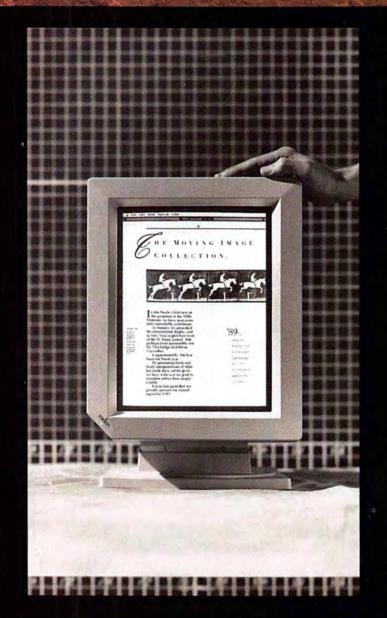
The left-hand caption says that a selection must be made in the pop-up box at the right before the tool can be used. That's wrong. The pop-up box offers options. If none are chosen, the tool defaults to the top (mouse) operation.

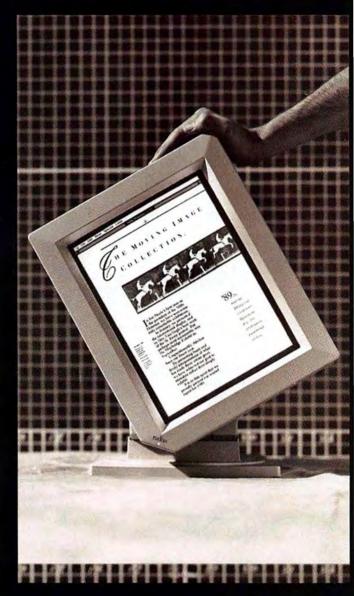
The comments on performance and printing might be misinterpreted. Performance is on a par with that of all other Mac drawing programs.



The photo of the Spectrum/24 Series III video board on page 105 of the March '90 issue is actually a photo of the SuperMac ColorCard/24. The Spectrum/24 Series III is shown here.





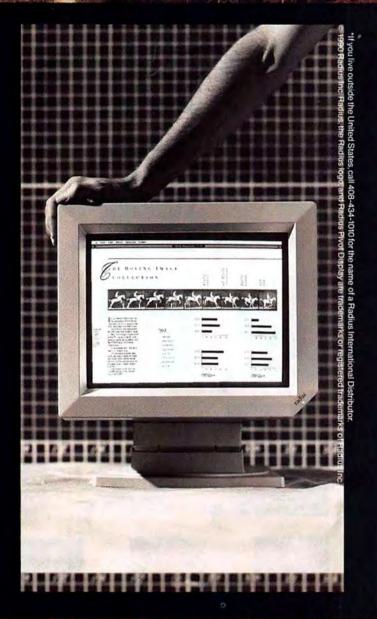


Once again, Radius turns display technology
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# radus





levels of gray are furnished, with upgrades to

16 levels for near-photographic quality images.

Ideal for graphic design and desktop pub-

lishing. Pivot is compatible with virtually

every Macintosh application and may be used

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a display for your Macintosh, check out another

amazing way to look at things from Radius.

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# What Created







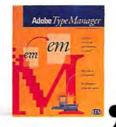






























and



# Think.





All the Macintosh® applications above were developed in THINK C® or THINK Pascal® Could it be coincidence? Think.

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t's not easy being red.

According to Microsoft chairman Bill Gates, who has awfully good information sources, the personal computer universe consists of 40 million "blue" systems (the nickname refers to the color of IBM's ubiquitous logo) and 3 million Apple-red Macs. Although the overall Mac market is disproportionately healthy — accounting for about 10 percent of all hardware but 20 percent of all software sales, and growing at a faster clip than the IBM side — these days Apple advocates need to have the patience of Job(s).

Everyone reading this column is fluent in the gospel of Macintosh-interface superiority. Proper training and support are obscenely more expensive on DOS machines. Mac users are far more productive than their IBM counterparts and use far more software packages each. The absence of numbing DOS

command-line complexity and nonstandardization frees Mac Apple's are packed with sophisticated window-oriented graphics tools. The Apple advantage is obvious from the moment you turn each system on. And it becomes even

clearer when you do normal housekeeping, such as setting up on-disk storage areas or moving and deleting files.

PAUL

Or does it?

All of a sudden, the gloom-and-doom merchants are pointing to another cloud on Apple's horizon. And this time, they argue, it's not just another squall; it's the Big One: Windows 3 (a.k.a. Win 3).

What makes this new Win in old bottles so fearsome?

Is it an awesome set of abilities? Is it an honest-to-goodness Mac-like interface? Is it unfettered power or unrivaled smoothness or intelligence? Guess again.

Much of the hand-wringing is the result of a front-page photograph in our sister publication, MacWEEK, in which Marc

BY PAUL SOMERSON

# **Ants in the Kitchen**

users to be much more creative, and the Mac's obvious graphics and audio superiority amplifies the expression of this creativity.

Unfortunately, some buyers are still hypnotized by the flea-marketsale prices of a good many IBM clones. They

confuse the price of the machine with the cost of running it. And while an entry-level Mac could help level the playing field a bit, bargain-basement DOS boxes will always carry substantially lower price tags.

This is yet another example of the old quality-versus-quantity problem that's been hamstringing American industry for years. Trying to halt the IBM momentum with a low-priced Mac is about as futile as trying to stop a tank with a rifle, even if you happen to be using the absolutely best-made rifle in the world.

Funny thing is that, under the skin, Macs and PS/2s are nearly identical. Try this: Take a IIci and a PS/2 model 50, pop off the lids, and invite a group of users to peer down into both and tell you which is which. Both systems are fairly advanced technological gems filled with surface-mounted chips and manufactured by two of the best hardware-design companies out there. Each has about the same footprint as the other, and each contains the same basic parts — similar power supplies, 32-bit slots, drive bays, ports.

The big difference is, of course, what's on the ROM chips. IBM's contain a modest set of routines that still pretty much make the system operate like a primitive Teletype machine.

Canter, chairman and founder of MacroMind, and Reese Jones, president of Farallon, are seen posing stiffly with Microsoft's Bill Gates.

Mac doomsters rank this photo right up there with the one of Stalin and Truman, How... could they! Here are two of the all-time archetypal Mac-forever DOS-haters actually sitting down and schmoozing with the enemy!

It gets worse. I buttonholed Marc recently and asked whether this was an aggressive strategic move, a protect-your-backside insurance policy, or a sign from heaven that John Sculley had better dust off the old résumé. Here's what he said:

"Apple ought to fire 9,000 more employees and get totally out of the hardware business and then concentrate on just being the best damn software company in the world."

When you read that, did beads of sweat start pooling in places where the sun don't shine?

If they did, towel down and stop worrying.

I have to admit, Marc's Apple blasphemy made me a bit apprehensive at first. So I got in touch with The DOS Guru, the brilliant, eponymous head of a wildly successful utilities-software company who knows more about DOS and Windows than Microsoft.

I asked him point-blank: "What's the magic about Win 3?"
"Easy answer," he fired back, "It's the eighth-of-an-inch difference."

How true. How accurate. How perfectly Zen-like.

The reason so many people are falling over each other to embrace Win 3 is that it has NeXT-like screens whose little eighth-of-aninch shadows make them look sort of three-dimensional. And color icons.

Stop the presses.

Is it seamless and well

hat's the magic about
Win 3? Easy
answer — it's the eighth-of-an-inch difference.

thought out and wonderfully integrated like the Mac? Well, no, but those scroll bars actually look like they're sticking up off the screen! Can you figure out how to work intuitively through any operation or run any application without a manual

the way you can with a Mac? No, but how about those color icons? Aren't they gorgeous!

Folks, get real. It's just DOS with a face-lift, a nose job, and some long-overdue liposuction. Stick a raw disk into a PC running Win 3 and the system grinds confusingly to a halt. Insert the same disk into a Mac, and it *understands*. Hmmm. This disk isn't initialized. Want me to do it for you? And verify the formatting operation automatically?

Big difference. Another big difference is perfor-

mance. The Mac is designed as a graphics machine. DOS is a text-based system. Windows runs on top of DOS. It's an extra layer of overhead. An extra-slow layer. Apple likes to show off by running the same Excel macro on a 16-megahertz Mac (not a IIfx, mind you, not even a IIci) and a 33-megahertz Compaq 386 system running Windows. The Mac blows Windows and the theoretically faster DOS machine into the weeds.

indows 3 is just DOS with a face-lift, a nose job, and some long-overdue liposuction.

But the skeptics persist. "Mac companies such as MacroMind are spending their resources on DOS systems instead of dedicating their efforts to widening the Mac lead."

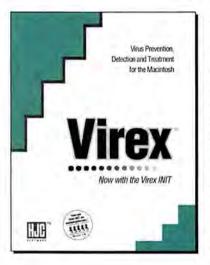
This reminds me of the story about people who have ants in their kitchen and decide to get rid of them by spreading a trail of sugar from the ant infestation out the door, hoping to lure them outside. What they end up with is more ants.

There are 50,000 DOS software packages out there, and 5,000 Mac packages. It's true that vendors will soon be able to write one icon-based, window-aware engine and port it equally easily to DOS and Mac (and UNIX) systems. But who is this going to help most? If half the vendors on each side of the red/blue divide suddenly start taking advantage of this ability, 2,500 Mac apps will suddenly run on DOS machines. But 25,000 DOS packages will just as suddenly work on Macintosh hardware.

I can't wait. 🛱

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It's not surprising that Virex\* is the premier anti-virus solution for the Macintosh. Virex was the first commercial antivirus software and the first to repair infected files. And now the Virex INIT included with Virex provides continuous system protection. But Virex is more than just a great product.

### Rapid Turn-Around on Product Updates.

Anti-virus software must be updated when new viruses occur to repair files infected by the new virus. Virex updates have been available within days of new reports. In fact, MacUser Magazine, 10/89, identifies Virex as "...the standard to match..." for updates. Virex now combats the WDEF virus.

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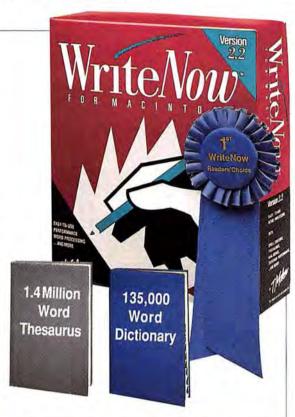
1.4 Million-Word Thesaurus How about 1.4 million new reasons? WriteNow now includes the Proximity WordMaster™ Thesaurus, containing 1.4 million synonyms, antonyms, compared, contrasted, and related word responses at your fingertips—it's the biggest in the Macintosh world!

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# 1988 MacUse 1988 MacUse Mac

### Reviews

6 6 WriteNow is the definitive Macintosh word processor. It's easy to use, powerful, and comfortable... Highly recommended. —John Dvorak, Industry Columnist

[WriteNow] might be The Best Program I'd Ever Used. On any computer—it's the fastest Macintosh word processor I've ever seen. —Jim Seymour, MacUser Magazine

Even if WriteNow is your first Mac application, you'll be up and running in no time.

We rate ease of learning excellent.

—INFOWORLD MAGAZINE

### Awards

1989 Editors' Choice Award,
'Best New Word Processor'—MACUSER

1989 Readers' Choice Award,
'Best Word Processor'—MACAZINE

#1 Rated Word Processor in Macintosh 'PC Week Poll of Corporate Satisfaction.'

-PC WEEK MAGAZINE

### **Comparison of Leading Word Processors**

	WriteNow 2.2	MacWrite II	Word	Works
Actual disk space needed:	(2) 800K	Hard disk	Hard disk	Hard disk
Thesaurus:	1.4 million	220,000	220,000	No
Spell Checker:	135,000	100,000	130,000	60,000
Mail Merge:	Yes	Yes	Yes	Yes
Format Accelerators:	Yes	No	Yes	No
Multiple Header/Footers:	Yes	No	Yes	No
Extensive Undo:	Yes	No	No	No
Retail Price:	\$195	\$249.95	\$395	\$295

### For more information...

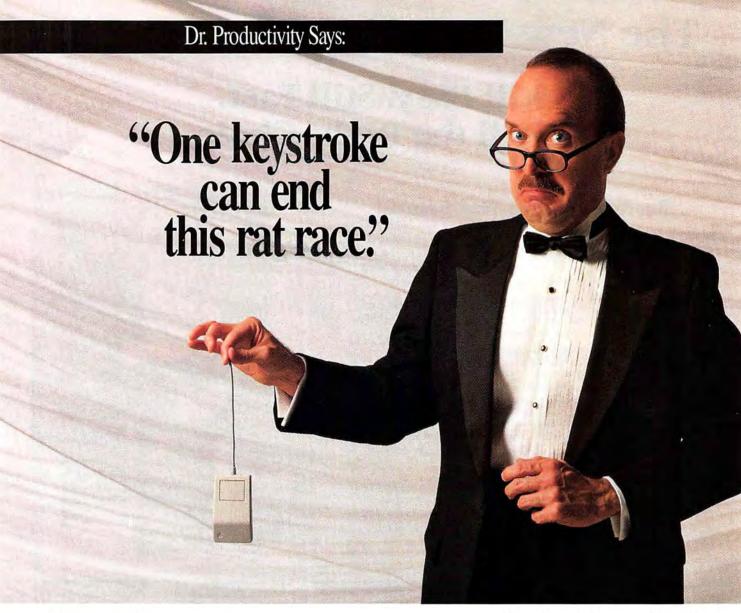
Registered users will receive WriteNow 2.2 upgrade information in the mail. Nonregistered users should call or write for details.

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# "If you want finger exercise, play the piano. If you want productivity, use QuicKeys."

"Want to know why users and reviewers love QuicKeys so much? Because an active computer user will stroke the keys over 1.5 million times – and race the mouse endless miles each year. QuicKeys is a fast, simple way to eliminate the *boring*, *repetitive* keystrokes you do over and over – and delete hours of *tedious* menu yanking from your life every year.

Sure, you increase productivity and save time. Big deal. The *real* value is all the little shortcuts that make computing so much more tolerable."

# "QuicKeys makes your Mac do the walking."

"It lets one keystroke eliminate a lot of mousing around. Have one QuicKey launch a program or set up a page. Define keys that enter entire paragraphs, or insert addresses, names or formulas. Anything you do repetitively, you can do in less time, with less aggravation. A stroke of genius."

### "Reviewers have spared no keystrokes in praise of QuicKeys."

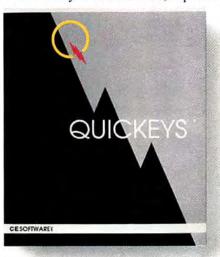


"MacUser gave QuicKeys a four-mouse rating and an Editor's Choice Award. Robert

Wiggins, of *MacUser*; says'It could send your mouse to retirement.' *MacWorld* named QuicKeys as one of the Goodies You Can't Be Without. *MacGuide* readers awarded it the Golden Gavel. *Byte* says, 'QuicKeys is right up there with sliced bread, the Great Pyramid of Cheops, and other wonders.' The raves go on and on."

### "Go to a dealer and try it."

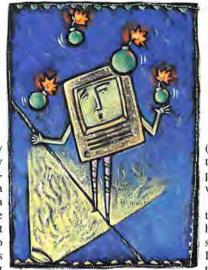
For the Macintosh. Suggested retail price, Version 1.2: \$99.95. For free literature and Where To Buy: 1-800-523-7638, Dept CE 23.



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# ROBERT R. WIGGINS

uring most of 1984, every Mac was exactly like every other Mac. This was considered good. Steve Jobs had a vision of the Mac as an "appliance" computer that was meant to be as simple to use as a toaster: Just take it out of the box and plug it in, and you're off into the fabulous world of computing. The Mac's closed architecture was meant to ensure that

every program written for the Mac would run on every Mac, because every Mac was the same.

Of course it didn't last. Third-party companies devised clever ways to get around the Mac's closed architecture and get their (the part of the operating system that draws to the screen) are currently supported, and programmers have to handle this as well as watching out for other compatibility issues.

The combination of these factors means that your system is unstable. No matter how hard you try, you can't avoid bugs and the system bombs that often accompany them. If you've used your Mac for any length of time, you know this and are accustomed to

at least occasionally clicking on the Restart button in the bomb dialog box (although in these days of MultiFinder, the bomb box is often replaced by the Unexpectedly Quit dialog box). So what can you do?

# **Unemotional Instability**

add-ons into the Mac, and Apple itself changed the rules with the 512K upgrade. Suddenly there were two official Macs, and some programs ran only on the bigger one. And with third-party add-ons such as GCC's HyperDrive, many combinations of software didn't work quite right. By the time Apple threw in the towel on the idea of a closed architecture and announced the open-architecture Macintosh II and the semiopen SE, there were dozens of hardware add-ons for the supposedly "closed" Mac Plus, and with Apple's blessing, there were quickly dozens more for the new slotted Macs.

It wasn't only hardware that made Macs different. Apple also bestowed its blessing on ways to "patch" the operating system. INITs (Startup documents), cdevs (Control Panel documents), and rdevs (Chooser documents) can all modify the operating system. Some of these miniprograms modify the same parts of the operating system, so you can end up with patches on top of patches on top of patches. Because of this, sometimes the order in which they are executed at startup is important, and the wrong order can cause problems. Some of these little programs, such as Suitcase, are safe and stable and make life a lot easier. Some, such as Adobe Type Manager, are mostly safe and stable, depending on what other programs you use. Some, such as SoundMaster, are safe and stable if you have enough memory. Some, such as Fish, aren't always stable. And some, such as SunDesk, Color Desk, and Color Cursor, are really unnecessary but fun to have around. Hundreds of these little programs are available commercially and via on-line services and user groups some are of dubious parentage.

The upshot of all these choices is that now every Mac is different. With up to seven devices on the SCSI bus; up to six cards in slots; and the thousands of combinations of INITs, cdevs, and rdevs, there are millions of potential system configurations — and you expect every program you buy to run on your system. Pity the poor programmers, who not only have all of this to worry about but also have to support multiple versions of the System from Apple. For example, five versions of QuickDraw

The first step toward greater stability is awareness. Join that user group, get on-line, read those books, and keep track of what's going on in the world. When programs or hardware have problems, you'll hear about it first on-line and in user-group

meetings and read about it in MacWeek. When you're planning to buy new hardware or software, check around and find out how safe it is.

The next step toward stability is to clean out your System Folder. Get rid of all those INITs, cdevs, and rdevs that you tossed in there to play with but never really use. Think twice about adding new ones: Remember the geometric progression of possible side effects with each new addition. And don't be a pioneer. Let others find out the hard way about the bad ones, and wait for the next version that fixes those bugs.

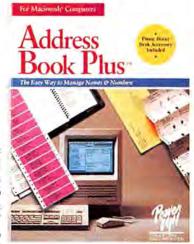
But the main thing you need to do to deal with the stability issue is to back up your data. No matter how simple your configuration and how pristine your System Folder, you'll get bitten by a bug eventually, and unless you're exceptionally lucky, it will take something with it, such as a file, a folder, or your whole hard disk. So back up regularly. If you use an incremental backup program such as DiskFit or Redux, you can finish your backup chores in

ow that INITs, cdevs, and rdevs can make every Mac different — and you expect every program to run on your system — pity the poor programmers.



BY ROBERT R. WIGGINS

If you flip it, find it, dial it, file it, list it, sort it, lick it, stick it, or stamp it, grab it. Fast.



Names, addresses, phone numbers, you know all those details that drive you crazy? Now, put them into one, easy-to-find place with Address Book Plus.™ Instant sanity. ■ Want to sort people by groups? Pinpoint them by Zip? List

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a few minutes each day, and those few minutes can save you days or weeks of aggravation when the worst happens.

You might want to consider archiving your data too. Retrospect is a program that combines the backup and archiving pro-

cesses so you can use it alone, or with another backup program. When Retrospect archives, new versions of files do not erase older ones, so you can go back and recover last Tuesday's version of a

o matter how simple your configuration and how pristine your System Folder, you'll get bitten by a bug eventually. So back up regularly.

document. This is particularly useful for important business data, since problems can develop with backups too. By archiving you decrease your potential exposure in case of a major problem. Archiving also provides insurance against those times when the copy of the document on your hard disk is damaged and you've been regularly backing it up. With archiving, you can go back until you find an undamaged copy and use it to re-create your work.

Making your Mac's system more stable just takes common sense. Keep your system simple, don't experiment (too much), stay informed, and prepare for the worst by backing up and/or archiving. Remember, while it's a lot of fun to be the first on the block with the niftiest new INIT, you'll probably stay more productive if you leave the testing to someone else. But if you must experiment, by all means protect yourself with regular backups and archives. And don't yell "Virus!" every time you encounter a problem: The vast majority of the time your problem will be a simple, unemotional conflict between pieces of software or hardware.

M-125

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Speaking of time, it doesn't take much to install Adobe Type Manager. Simply drag it into your system folder and you'll never have to think about

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em



# INTRODUCING NEW DISKLOCK

Unbreakable password protection for the Macintosh

It's sad but true. All it takes is a few minutes with your back turned, and an intruder could walk away with your most confidential data. And you'd never even know it!

### Unsurpassed Password Protection

Now the leader in hard disk security announces the ultimate data protection system for your Macintosh. **DiskLock** works with any SCSI hard disk to provide foolproof password protection for individual files, folders, or your entire hard disk. You can even protect all three levels with different passwords for absolute maximum security. **DiskLock** automatically locks your files when you shut down or leave your Mac unattended, and alerts you to any unauthorized access attempts.

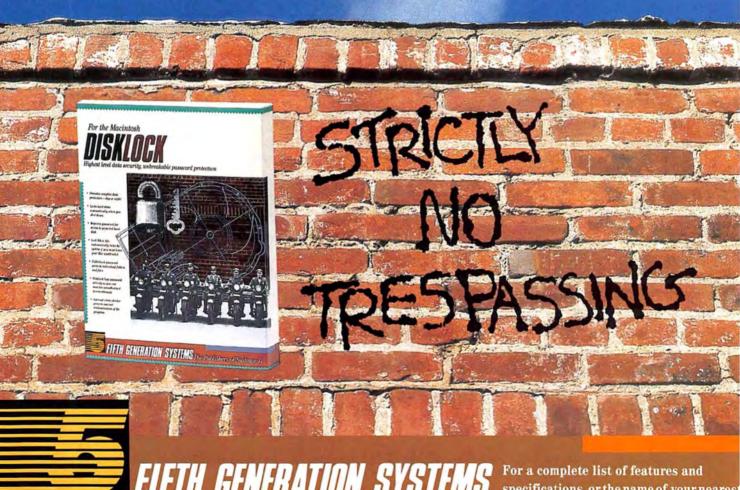
Sophisticated Data Encryption
State-of-the-art data encryption adds
yet another layer of security. Without
the proper password, your confidential
files appear to contain nothing but
gobbledygook!

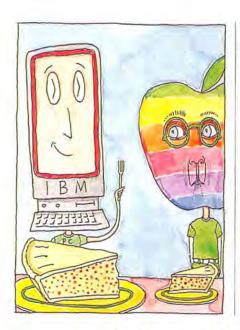
Multiple Security Levels.

DiskLock lets you give each user password access to just the files you choose (word processing files for your secretary, accounting files for your bookkeeper, etc.). The master password gives you access to all files and folders.

Virus Protection, too!

If DiskLock's automatic virus checker detects an infection when you log in to a file, it notifies you and stops running immediately.





# 2. Do one thing astoundingly right. To get respect back in the personal-computer industry, you need to create one astounding innovation. (And I mean without the assistance of Microsoft or

# GUY KAWASAK

the assistance of Microsoft or NeXT or Mitch Kapor.)

I'm not sure what it should be, but when people see it, they should say, "I can't believe *IBM* did this." (When you first saw a Mazda Miata, didn't you have this reaction?) It doesn't matter whether it sells or not as long as people see that IBM can do really cool stuff.

3. Play up your strengths. Let's face it, even if you do the One Astounding Thing, you aren't going to out-innovate Apple in the near term. Instead, consider attacking Apple in areas in which you excel and Apple cannot respond:

Support. Apple, unlike IBM, doesn't allocate a lot of head count to support. Instead, it depends on its dealers. A few good Apple dealers (such as North Shore Computers in Milwaukee) do come through, but you can mobilize a tremendous support network around the whole world. How hard could it be to make a prospective Macintosh owner feel paranoid about support?

# A Dear-John Letter

hese are interesting times: Mike Tyson gets knocked out. Perrier is recalled. Jean-Louis Gassée resigns. Donald and Ivana Trump separate. Apple eighty-sixes Allan Loren. (OK, the last two may not be that surprising.)

I'm sure every Macintosh columnist worth his or her weight in DRAMs is going to espouse his or her theory about what Apple should do to regain its luster. You probably think I'm going to also.

You're wrong. I'm not a masochist, and I'm afraid I'll need Apple's help someday if I start another Macintosh company. Anyway, why waste my time? All the advice will fall probably upon deaf, though no-longer-pierced/French, ears.

Instead, I'm going to write about what IBM can do to take advantage of the situation. Here is a draft of a letter to John Akers, the chairman of that firm.

Dear John:

Apple is providing you with an excellent opportunity to regain your lost market share in the personal-computer industry. I've come up with some ways for you to beat Apple in the '90s. My motivation is twofold: to drive down the price of Apple stock so I can buy some and to scare Apple into moving in the right directions.

Here are my ideas:

1. Stop trying to out-Apple Apple. Stop trying to be California-hot-tub cool. You aren't cutting it. You never will. Funny videos, reality-distorting product introductions, and event marketing just aren't you. (I swear if I ever see an IBM Helocar ad, I'll crush my entire collection of Selectric type-writer balls.)

You don't need to out-Apple Apple. There are lots of people who just want a safe, mainstream personal computer. IBM trying to act like Apple is like Johnny Carson trying to act like Arsenio Hall. Johnny doesn't need to.

Stability. Tell me the truth: Every time you read about an Apple reorganization, do you start rolling on the floor with laughter? Do you take Apple seriously at all? Most people I know want to buy their computers from stable companies.

4. Concede the multimedia market. About six months ago, I saw a demonstration of IBM's multimedia technology and I was rather unimpressed. The stuff that you guys consider

whizzy wouldn't even pass as B-grade HyperCard stacks or Apple II demos.

Cut your losses, and concede multimedia to Apple. Instead, continue positioning your computers as wacko-mainstreamproductivity killers. After all, the spreadsheet/database/wordprocessing market is still fairly substantial.

5. Revamp your television commercials. The "M\*A\*S\*H" stuff was bad. Were you out horseback riding when the agency brought by the comps for the campaign? No one in their right mind would buy a computer simply because the cast of "M\*A\*S\*H" endorsed it. (I assume that you consider people in their right minds to be your target market.)

Here are my two advertising ideas for IBM:

"1994." Ivana Trump, dressed in red Christian Dior shorts and ne astounding innovation is all IBM needs to win back the industry's respect.



BY GUY KAWASAKI



business market. Trumped again."
"Innovation." An IBM PC comes into view, and a voice says, "This is a highly innovative personal computer. Its company has all these patents for technology." Wham! A three-foot-high stack of your patents slams onto the table, practically breaking it.

# hatever happens at Apple, the dream that Mac people share is alive and well.

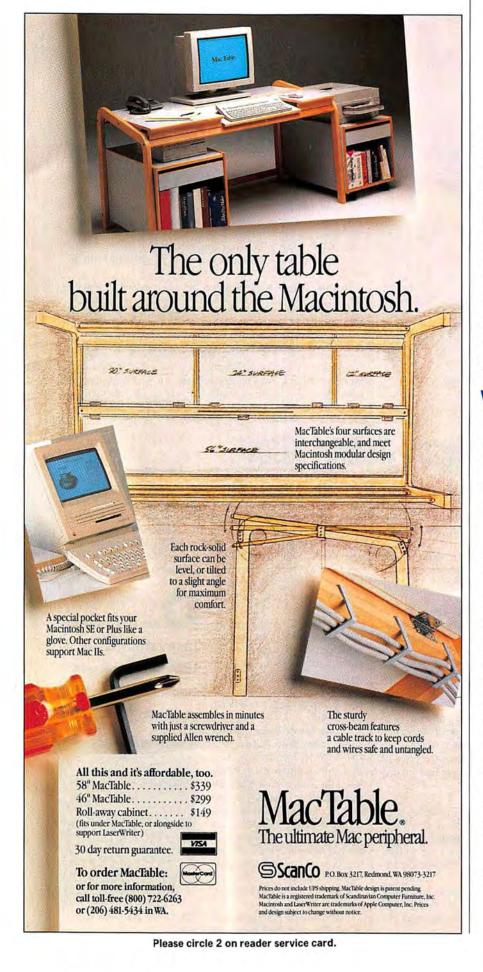
Then a Macintosh comes into view, and the voice says, "This is a highly innovative personal computer too. Its company files lawsuits." Three lawsuits float gently down to the table. Voice: "Which company do you think is more innovative?"

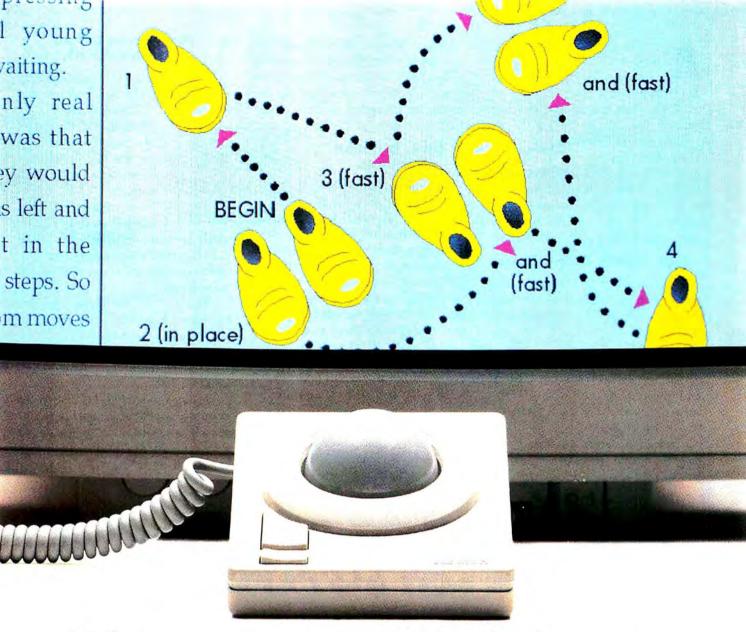
**6. Don't let sleeping fruit lie.** One last thing — don't ever underestimate Apple employees and Macintosh owners. With proper management — heck, with *any* management — Apple employees could kick your butt back to the typewriter business. You're lucky that Apple reorganizes once a quarter to appease analysts about lower earnings.

Macintosh owners are a loyal bunch. Not in the dain-bramaged sense that their corporations have "standardized" on Macintosh so that they cannot switch. They have good taste, and you will not fool them with yet another graphical user interface.

Never forget that Apple employees and Macintosh owners share a dream — the Macintosh dream. And no matter what happens at Apple and what you try to do, the dream is as alive and well as ever.

Warm personal regards, Guy Kawasaki





# This mouse will glide you across the big screen.

Abaton engineered the ProPoint to whisk you around your big screen faster and smoother than the average mouse. You see, the original Mac mouse was designed for the original nineinch screen. And while displays have grown, the original mouse hasn't. The Abaton ProPoint was designed specifically to help desktop publishers glide around large displays with ease.

With the ProPoint, you move just the billiard-sized ball — instead of the whole mouse. So you can cover your desk with papers and still cover your entire display with just a flick of the wrist. Using optical technology (rather than the traditional mechanical), and electronic acceleration, the ProPoint moves

quickly across even the largest screen. And our lock button lets you select and reposition an item, paragraph, or group without holding down a button while you move. Giving you greater accuracy and agility with less effort.

Which makes design, illustration, and paste-up much easier on the Mac.

If you own a big screen, shouldn't you own the mouse designed to glide around it. Call Abaton at *1-800-444-5321*. With the Abaton ProPoint, all your big ideas will be easier to publish.

Museu and "We Make how bless Faster to Fabboh" are traderrarked better Soutens. In: Other based cames and product comes are trademarks or registered trademarks of their trademarks of their soutens. In: 18111 Manual Boye, Fernant, CA 2558.

We Make Your Ideas Easter to Publish\*\*

Please circle 56 on reader service card.

s you can see, with the Personal LaserPrinter™ II (PLP™ II) from GCC Technologies, you get output that is absolutely stunning.

Crisp, clean, professional, and razorsharp.

If you think PLP II's output is stunning, you'll think the same of its price: an incredibly low \$1,399. It's the lowest-priced laser printer ever for the Macintosh.

And the most impressive. MacUser magazine was impressed: PLP II was this year's Editors' Choice Award Winner.

#### **High-Quality Outline Fonts.**

The beauty of PLP II is that it can do the same things many expensive laser printers can do. For only a fraction of the price.

Fonts Phay

Because PLP II includes 22 Bitstream® outline fonts, its output can be shaped, scaled and rotated, as well as enlarged or reduced to any size—all at a full 300 dots per inch (dpi), and at 4 pages per minute. Which means you have unlimited flexibility in printing all kinds of applications such as text from Microsoft Word,\* newsletters from Aldus\* PageMaker,\* and illustrations and scanned photos from Canvas\* and SuperPaint.\*

#### Other Beautiful Features.

Another reason the Mac-User editors couldn't take their eves off PLP II was its user-

friendly front-panel LCD display. Who could blame them? With the simple push of a button, you can set your SCSI ID. Check your percentage of consumables used. Adjust your print density. And more. But what the MacUser editors especially liked was PLP II's "sleep mode," which automatically silences the printer

when not in use.

When it's time to print, PLP II supports a variety of paper weights, including envelopes and transparencies. And with GCC's new desk accessory QuickEnvelope,™ printing envelopes is a snap.

#### More Power To You: The New PLP IIS.

For those who want beautiful output with a whole lot of power, there's our new PLP IIS. (The "S" stands for speed.)

With the PLP IIS, you get all the breakthrough technology of the PLP II, only now, you get it at a swift 8 pages per minute.

One megabyte of RAM is standard on every PLP IIS,

which saves you valuable time. While PLP IIS prints the first page of your document, your Macintosh can now process the next page.

With PLP IIS, you get an expanded font library. In addition to the core set of 22 Bitstream outline fonts, you also get our font package called Fonts Plus, (a \$239 value) which means you'll have over 40 fonts to choose from.

The new, powerful PLP IIS and the award-winning PLP II. For the Macintosh® user who wants the beauty of great output at a great price. And what could be more beautiful than that?

# BEAUTIFUL OUTPUT. BEAUTIFUL PRICE. THE NEW \$1399 PLP II.



#### Dealer or Direct: Your Choice.

GCC has made acquiring your new PLP II and PLP IIS just as easy as using them. If you would like to see a demon-

stration and purchase your printer today, simply visit one of GCC's authorized dealers. For the location of the dealer nearest you, call,

#### 800-422-7777.

To order direct from GCC, call us toll-free from 9 AM to 8 PM (EDT) on weekdays, or 10 AM to 4 PM (EDT) on Saturdays. Our trained staff can answer your questions and offer advice

on any of our products. (Be sure to ask for our free catalog.) Orders received by 8PM (EDT) for in-stock items will be shipped the same day via overnight delivery for only \$9.

> What's more, when you buy direct from GCC, we guarantee your satisfaction with a 30-day moneyback guarantee.

#### **One-Year Warranty.**

PLP II and PLP IIS both carry a full one-year warranty on parts and labor. We offer repair service here at GCC and at hundreds of GCC

dealers nationwide.



When you call, be sure to ask for our free catalog.

#### PLP II \$1399. PLP IIS \$1899.

We gladly accept MasterCard, Visa, American Express, or your company's corporate purchase order.





Peripherals With Vision. Please circle 353 on reader service card.

Ad# 021069

Getting ready for a special night

enough versatility to wear a skirt for virtually any occasion, including dancing in a club or dining in a fancy restaurant. By adding your tavorite blouse, sweater, or jacket, you can create a look that's comfortable for you and is fashionable Make the outfit unique by adding at unusual scart or a trendy pair of shoes or boots. By blending you favorite all-time styles with what hot in the world of tashion, you sure to be a hit.

By carefully applying makeup youra cloth comf tash it gi cris for ne

n the outside chance that perhaps you haven't experienced a GCC Technologies'™ UltraDrive, let us take you inside.

For it's there that you'll find what makes UltraDrive the most reliable hard disk in the Macintosh® industry.

#### **Highest-Quality Components.**

Everything that goes into UltraDrive has been meticulously designed and exhaustingly tested. The result: only the very finest components are used. Like the best hard drive mechanisms from Quantum, Seagate, and Hitachi.

UltraDrive is an engineering marvel inside and out. It features an easy-to-use push-button SCSI selector switch, a security loop to protect against theft, double-shielded cables, a universal power supply and a low-noise cooling fan. Plus a custom-designed wire harness, which protects sensitive wires from exposure to the power supply.

When you've been making hard disks for the Macintosh longer than anyone else, even longer than Apple, it's not surprising your disks are more reliable.

#### An Abundance Of Software.

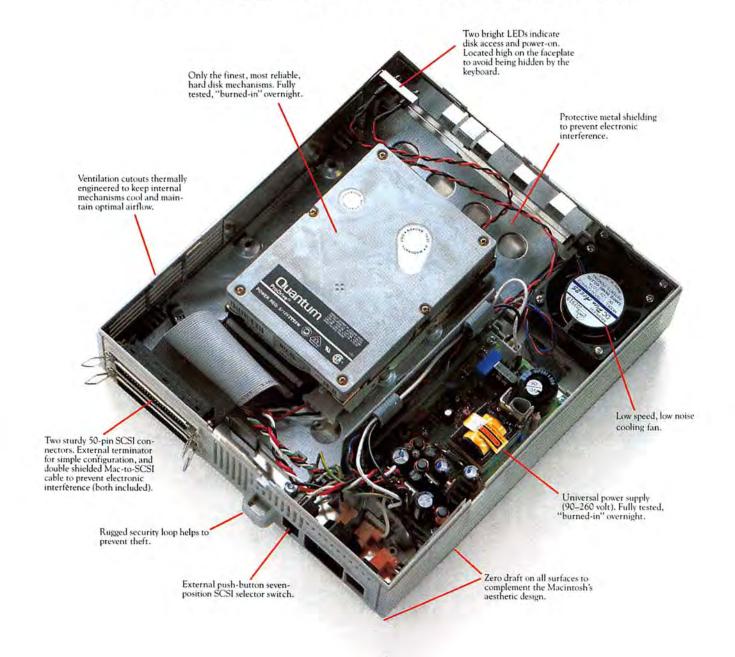
Every UltraDrive comes with an impressive array of value-added software.

Included are SUM™ II from Symantec.™ UltraWare,™ which features GCC's DriveManager,™ QuickSpool™ II, and QuickEnvelope.™ And finally, SelectShare,™ over 3 megabytes of the very best public domain software available.

#### Ultra Drive S

If you like what you've seen so far, let us introduce UltraDrive S. It's the only hard

# IF YOU DON'T OWN AN ULTRADRIVE, YOU SHOULD LOOK INTO IT.



disk nominated as MacUser's Best Storage System of 1989. And UltraDrive Sincludes all of the same high-quality components, detailed engineering features, and sophis-

ticated software that you'll receive with UltraDrive.

But what sets UltraDrive S apart from the competition is its incredibly fast average access times, its use of on-board disk caching, and a 1:1 interleave on all Macintosh CPUs. Which means that your hard disk will always operate at maximum speed.

So, any way you look at an UltraDrive, you'll find a hard disk to suit your needs.

#### Dealer or Direct: Your Choice.

If you would like to see a demonstration and purchase your hard disk today, simply visit one of GCC's authorized dealers. For the location of the dealer nearest you call,

#### 800-422-7777.

To order direct from GCC, call us tollfree from 9 AM to 8 PM (EST) on weekdays, or 10 AM to 4 PM (EST) on Saturdays.

Our trained staff can answer your questions and offer advice on any of our products. (Be sure to ask for our free catalog.) Orders received by 8 PM (EST) for in-stock items will be shipped the same day via overnight delivery for only \$9.

What's more, when you buy direct from GCC we guar-

antee your satisfaction with a 30-day moneyback guarantee.

#### Two-Year Warranty.

All UltraDrive and UltraDrive S hard disks carry a full two-year warranty on parts and labor. We also offer repair service here at GCC and at hundreds of GCC dealers nationwide.

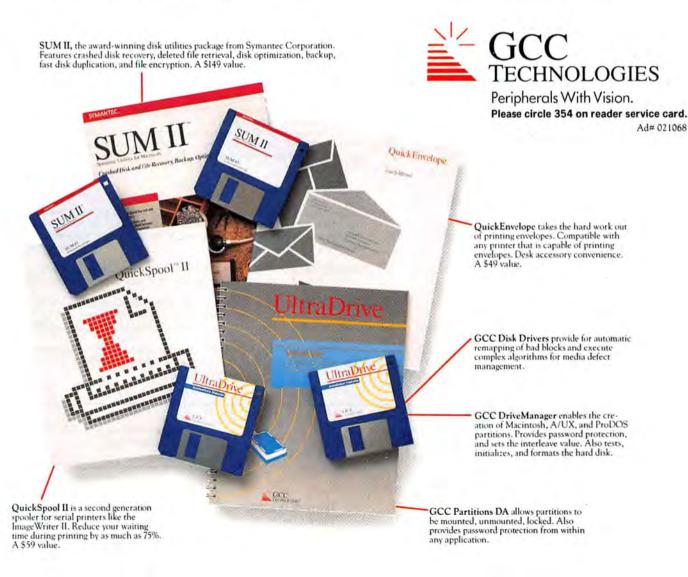


When you call, be sure to ask for our free catalog.

#### The UltraDrive Family.

Model	External	Interna
UltraDrive 20	\$549	NA
UltraDrive 30	\$629	\$529
UltraDrive 45	\$699	\$599
UltraDrive 80	\$999	\$899
UltraDrive 200	\$1899	\$1749
UltraDrive 240	\$2199	\$2049
UltraDrive 40S	\$799	\$649
UltraDrive 80S	\$1099	\$949
UltraDrive 100S	\$1299	\$1149
UltraDrive 175S	\$1799	\$1649

We gladly accept MasterCard, Visa, American Express, or your company's corporate purchase order.



# Understanding AppleSpeak

You've got to love the creativity in Apple's press releases. In case you've never seen an Apple press release, here's the one about Jean-Louis Gassée's resignation. Oh, yes — we've also added some interpretations for you — the French correction, if you will. As you learn to read between the lines, you'll discover the real meaning of the Cupertino communiqué.

Jean-Louis will be on the payroll for months. Oh, don't worry; he won't be punching a clock from 8 to 5 like a wage slave. He'll probably never come in. This is a way to slide Jean-Louis a nice severance package without upsetting the other employees.

. . . but not his taking the spotlight from John.

... as long as he doesn't compete with Apple or raid its employees — if he wants a severance package.



Press Information

FOR IMMEDIATE RELEASE

Friday, March 2, 1990

Contact: Barbara Krause
Apple Computer, Inc.

(408) 974-3719

Christopher Escher

Apple Computer, Inc. (408) 974-2202

#### Apple's Gassée Announces Resignation

CUPERTINO, California--March 2, 1990--Apple Computer, Inc. today announced that Jean-Louis Gassée, 45, president of Apple Products, intends to leave the company after an orderly transition of his responsibilities.

"In light of recent organizational changes at Apple, Jean-Louis and I have discussed at great length how his personal career goals fit in with opportunities for him at the company," said John Sculley, Apple's chairman and chief executive officer. "And Jean-Louis has decided that this is an appropriate time for him to move on. While we will miss his leadership, integrity and spirit, we understand his decision: He has our very best wishes in his new pursuits.

"As we go forward, we know that Apple's product organization is the strongest and most technically-proficient in the industry. As a result, Gassée's departure will not slow down current product development plans," said Sculley.

The company's engineering networking and communication, and advanced technology efforts will now report directly to Sculley. The company's worldwide product marketing and manufacturing functions began reporting to Michael H. Spindler, chief operating officer, in January of 1990.

Reporting to Sculley are:

Edward Birss, 37, senior vice president, Product Engineering. Birss is a 10-year Apple veteran and has held a number of key engineering and product development posts at the company, including director of software engineering and manager of advanced technology and manager of education research.

Donald P. Casey, 43, vice president, Networking and Communications. Casey joined Apple in 1988 in his present role after a prominent 21-year career at the IBM corporation.

Larry G. Tesler, 44, vice president, Advanced Technology. Tesler is a 10-year Apple veteran and has held a number of senior technology positions at the company. Prior to Apple, Tesler was a member of the research staff at Xerox Palo Alto Research Center.

"We are very confident we have the senior technical talent to take Apple to the next stage of its growth as a technical innovator in the industry in the 1990's," said Sculley.

-30-

These three studs are in place, so don't worry about Jean-Louis' leaving.

By Guy Kawasaki

The word is *plans*.
There is nothing said about *delivery*.

This press release was created on an SE/30.



ILLUSTRATION DAVID COULSON

Barbara and Christopher are the fall guys. Apple puts out this weak explanation, and then anyone who has questions about it is supposed to call Barbara or Christopher.



This is announced on a Friday in the hope that something bigger will happen over the weekend and the press will lose interest by Monday.

John demoted him, and one of Jean-Louis' personal career goals was not to go backward.

Jean-Louis told John to stick it in his NuBus slot.



We have the best set of weights and the best health club in the personal-computer industry.

Spindler is this quarter's golden boy. Stay tuned for the next purge.



It's already down to a snail's pace because of all the re-orgs. Nothing could slow it down more.



"...at the IBM corporation"?
The consultant who writes
Apple's press releases gets paid
by the word. The phrase "at IBM"
would mean less compensation.

# NewsLine

**Reports and Analysis** 

#### GASSEE GOES, WARRANTY GROWS

CUPERTINO, CA — Capping several weeks of anticipation, Jean-Louis Gassée officially resigned as president of Apple Products in March. Gassée will remain with Apple for an unspecified transitional period, and Apple chairman, president, and CEO John Sculley will take over Gassée's responsibilities while a replacement is sought.

Even as Gassée's time at Apple comes to an end, Apple is breathing new life into its moribund warranty: Retroactive to January 1, 1990, the company is now offering a one-year warranty on all Apple hardware.

#### **IBM GOES WITH ADOBE**

BOSTON, MA - In a move that industry observers had expected for months, IBM announced it would use font technology from Adobe Systems in its new computers and printers that conform to its Systems Application Architecture, which, in effect, covers everything from the PS/2 line to the company's mainframes. The announcement boosted Adobe's stock, while casting some doubt on the joint Apple Computer/Microsoft font technology, called TrueType, which was announced last September. IBM said it will include the Adobe font technology in OS/2, but it will also offer the Apple/Microsoft technology as an OS/2 option. Microsoft is also expected to promote the use of TrueType with all its MS-DOS systems

#### CHAPTER 11: JASMINE FILES FOR BANKRUPTCY

SAN FRANCISCO, CA — The latest chapter in Jasmine Technologies' turbulent history is Chapter 11. The hardware manufacturer has filed for protection from its creditors under Chapter 11 and is looking for sufficient capital to refinance the company.

An official Jasmine statement said that 70 percent of the employees were being asked to take a three-week furlough while executives sought new financing. The statement went on to say that Jasmine intends to fill all outstanding orders, for both service and purchases, but that delays should be anticipated. The statement also indicated that the bankruptcy court will repay buyers who wish to cancel their orders once Jasmine has cleared Chapter 11.

Apple has a PARC visionary on board — so don't worry, be happy.

# StartUp

# Rnhker's Dozen

#### BY STEVEN BOBKER

Bobker's Dozen, c/o MacUser 950 Tower Lane, 18th Floor Foster City, CA 94404

Your suggestions, comments, and products for consideration are welcome.

# **Authenticate and Mutate**

Two of the more useful HyperTalk extensions I've seen recently are Authenticate and Mutate.

Authenticate is an XFCN that can check or validate the contents of any field, using

> he hundred venty-nine llars and tht cents

programmer-specified criteria, before the data is written to disk. The programmer also dictates error response. The checking procedure is UNIXlike pattern matching, and it definitely helps if you're already familiar with this type of procedure. The brief manual adequately explains how to set up and use Authenticate.

Mutate contains several XFCNs for formatting text fields. It is not as useful as

Authenticate, but it does help create more-attractive products. Mutate's functions can even be chained to produce complex transformations. It translates numeric monetary values into spelled-out numbers, formats any text according to a preset pattern (Social Security numbers, for example), translates to equivalent text with a lookup table, pads text with leading or trailing spaces, and truncates or trims text to a preset length.

Authenticate and Mutate are useful but not cheap. Although their performance is excellent, both require a reasonable amount of programming skill. The package also includes versions of the code that can be used with 4th Dimension.

SoftStream International, 19 White Chapel Drive, Mount Laurel, NJ 08054; (800) 262-6610. Combined package (Authenticate, version 2.4; Mutate, version 1.0), \$125.

# FetchiT

The most recent Get File and Put File Standard-Filedialog-box enhancer I've come across is FetchIT 2.01. FetchIT adds a pop-up menu on the right side of the smallicon and disk-name dialog boxes. The first item on the menu moves you up a level in the file hierarchy (just as clicking on the name does when you don't have FetchIT installed). The next item presents a submenu list of all mounted drives and lets you move to any of them. The next command creates anew folder.

The best part of FetchIT is the Look' fer command, which searches the text in all files (open and closed) of a specified directory for a user-specified string or strings. Multiplestring searches can use simple Booleans, and case sensitivity can be toggled on and off.

The menu concludes with the Find (filenames), Get Info, and Utilities commands. The utilities include file deleting, renaming, and duplicating.

Overall performance is





superb; I've found no conflicts with any of my INITs.

CRA Z Software, P.O. Box 6379, Haverhill, MA 01831; (508) 521-5262. Version 2.01. \$25.

# ParaFont

When your laser fonts don't include all the characters you want, ParaFont can add these missing characters or even change whole fonts to suit your needs. It's particularly good at creating fractions.

ParaFont works on any laser font (Type 1 or Type 3), but its output is a Type 3 font.

You'll also need to keep the original base font around when using a ParaFont font on a PostScript printer.

If you use ATM with ParaFont, you can easily build large screen fonts for use with non-PostScript printers. However, ATM requires Type 1 fonts for output, so you'll have to convert ParaFont's fonts, using a third-party conversion utility (such as Altsys' Metamorphosis), for them to work with ATM's.

ParaFont behaves well and is quick and easy to use. Design Science, 6475-B E. Pacific Coast Highway, Suite 392, Long Beach, CA 90803; (213) 433-0685. Version 1.02. \$99.

The most basic bar codes, such as the UPC (Universal Product Code) and its cousin, the EAN (European Article Number), follow rigid formats and include calculated check digits. Just having a bar-code font isn't enough for creating correct UPC or EAN codes. Someone, or some program, must calculate the

check digit and add the necessary left, center, and right marks and guides. PrintBar does that and does it well. PrintBar also supports the

other common bar codes, Interleaved 2 of 5 and Code 39, which have broader and more general uses.

Using PrintBar is quite simple. You type or paste in

the values or text you want coded, and the program prints out the correct bar codes. The three volumes print different codes and are optimized for different printers. Both ImageWriters and LaserWriters (PostScript and non-PostScript) are supported, as are Linotronic high-resolution PostScript typesetters. Volume 1 covers Code 39; volume 2 covers UPC-A, UPC-E, and EAN:

#### **BOBKER'S DOZEN**

# Inspiration

My comments on Inspiration in the December '89 Bobker's Dozen (page 302)

drew quite a few dissenting letters. My BBS reading also made it clear that a substantial group of fanatic users has adopted Inspiration, Thus, I decided to take another look at it.

This time, I looked at Inspiration 2.02 (versus

2.0 in December). The printing-speed problems have been cleared up, although I still find the output unattractive.

When it is viewed primarily as a brainstorming tool. Inspiration shines brighter. It's easy to capture the results of a brainstorming session, and af-

> terward, you can manipulate and organize all the ideas you have generated.

If you frequently do unstructured brainstorming, take a good look at Inspiration [or IdeaFisher or MindLink, re-

viewed in May '90, page 67-Ed.].

Ceres Software, 2520 S.W. Hamilton St., Portland, OR 97201; (503) 245-9011. Version 2.0.2.

## MacTable

The new version of the MacTable desk is stronger and easier to assemble than its predecessor. It also takes up slightly less floor space without shrinking the working area.

The tan wood and gray laminate design is very attractive. It has four separate surfaces that can be configured to handle any Mac or peripheral. Users of Pluses, SEs, SE/30s, and single-page portrait monitors can put their units in a back-sloping recess to improve the screen angle. You can also slope the keyboard area for safer and more comfortable use.

This version of the MacTable was considerably easier to assemble than the original — the whole project took only about a half hour. A variety of accessories is available, including a roll-about storage unit that either stores under the MacTable or can be used separately as a printer stand.

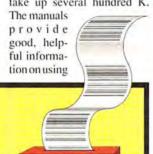
ScanCo, P.O. Box 3217, Redmond, WA 98073-3217; (800) 722-6263 or (206) 481-5434. Standard (58 inches), \$339; smaller, (46 inches), \$299; rollaway cabinet/printer stand, \$149; file cabinet, \$259; bookshelf, \$129; storage cabinet, \$179.

# Dimensions, Dimensions 2, Natural Images

These three packages contain large, complex EPSF (Encapsulated PostScript Format) files designed for use as backgrounds or design elements. The Dimensions series contains abstract and rhythmic designs; Natural Images draws on shapes from nature. The files are big: Dimensions comes on three disks and has ten designs. There are two variations of each design, either high and low contrast or light and dark. Dimensions 2

comes on four disks and has ten more designs (two more variants of each). Natural Images comes on five disks! It too has ten designs, each in two forms

The files are easy to use as long as you have sufficient RAM — a full-page file can take up several hundred K.



and volume 3 covers Interleaved 2 of 5

Operation is a bit clunky, but performance is fine. Printouts are quick, and your results are also easy to place in any other program. This is the best product of its kind I've seen, and it's reasonably priced too.

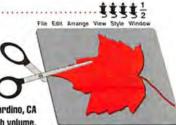
Bear Rock Software, 6069 Enterprise Drive, Diamond Springs, CA 95619; (916) 622-4640, Version 2.0. \$225 per volume.



the files. They include design examples and tips on modifying the actual artwork.

I can't imagine a serious desktop publisher passing these packages up.

ArtBeats, P.O. Box 20083, San Bernardino, CA 92406; (714) 881-1200. \$99.95 each volume.



# Shanghai

The new Shanghai 2.0 isn't merely a set of cosmetic changes to a hoary classic game. It adds the cosmetic upgrade - and a lot of playability-enhancing intelligence.

You'll see the most obvious enhancement only if you have a color or gray-scale monitor. On such monitors, the playing area automatically enlarges to the size of the screen and the tiles appear in full color (up to 256 colors) or shades of gray. The color is spectacular.

The other new features are available to everyone. Sounds and music have been added to all aspects of the game. There's no copy protection. Shadows make it much easier to see buried tiles. And, most important, the game knows when you've run out of moves and tells you so.

There's no upgrade path from the previous versions, but the price is so low that you shouldn't hesitate to pick up a copy of Shanghai 2.0.

Mediagenic, 3885 Bohannan Drive, Menlo Park, CA 94025; (415) 329-0500. Version 2.0. \$29.95.

# **Start Up**

### **BOBKER'S DOZEN**

# SuperLaserSpool

One of the most damaging criticisms of HP's superb DeskWriter printer (see Bobker's Dozen, April '90, page 39) was its failure to work with any print spoolers. SuperLaserSpool 2.02 (see the

MacUser Labs Brief "Print

Spoolers," April
'90, page 223)
provides excellent DeskWriter

support. Documents spool rapidly, and the Mac operates smoothly except for the first few files (when the print file is apparently being created). I had no trouble writing this piece while simultaneously printing another article and also downloading a file (under MultiFinder) from the MacUser Download Area on C o m p u S e r v e ( G O MACUSER).

SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94088; (408) 245-2202. Version 2.02. \$149.95.

# **O**DisKeeper

\*\*\*

DisKeeper, a shareware application, produces a report that, in its most basic form, lists all your files and tells you if there are duplicate, locked, or invisible files anywhere. It also reports empty files and application and INIT version numbers, and it indicates whether or not there are any orphans (files whose creator application can't be found). Locked, invisible, empty, and single-item folders are listed. You can select just what you want to look for, with pop-up option menus.

All the details are reported in a large text file. Files can be moved from within DisKeeper — as it's working — to a special Trash folder for eventual disposal. DisKeeper can handle up to 10,000 files, 3,000 folders, and 99 volumes.

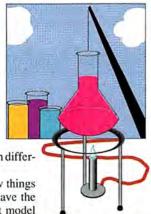
Pad-Parrot Productions, 7H Laurel Hill Road, Greenbelt, MD 20770; written inquiries only. Version 1.1. Shareware: \$10.

## Model-It!

Model-It! is a good tool for mathematical modeling or simulating small and/or simple dynamic systems. You build your models visually with blocks that are easy to create and define. Output can be visually presented in graph form, or you can see the numerical data that drives the visual output. You can also elect to see the output and data

elect to see the output and data in different windows at the same time.

Model-It! helps you see how things run, but you need to already have the knowledge to build the correct model



in the first place. The manual, which is clear and quite good,

is emphatic on that last point.

Performance is reasonable but nothing to write home about. Input facilities are adequate; output is pretty barebones. Very large models degrade performance noticeably. Still, many engineers and scientists will be able to get a lot of value from Model-It!

Norris Software Systems, 5201 Western Ave., #432, Knoxville, TN 37921; (615) 588-5774. Version 1.0. \$295.

# 1 MacInfo

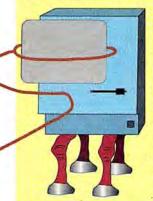
ttt1

MacInfo is a good attempt at solving the Mac bibliographic "Where Is It?" problem. It's a subscription service that provides a monthly bibliography, in database form, on a disk. The database is in EndNote (another Niles and Associates product) format, and Niles offers EndNote to subscribers at a reduced price. It's not the greatest format for this sort of index — there are no abstracts — but it works.

The first volume contained more than 2,800 entries from Mac publications between February 1989 and the end of the year. Each monthly update, which can be combined with your existing database, promises at least 300 new references. The copies I've received back up that claim. MacInfo becomes more useful each month.

Niles and Associates, 2000 Hearst St., Berkeley, CA 94709; (415) 655-6666. \$120 per year (includes 12 updates); \$99 for academics, developers, user groups, and dealers.

# **13** QuickShot

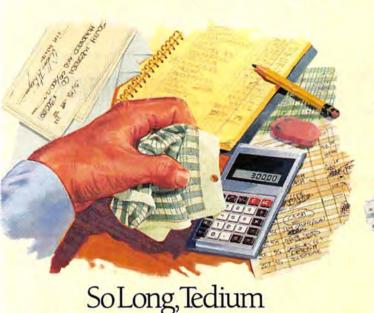


This month's screen-capture candidate is QuickShot. It has two components: an Fkey, which is used to start the actual capture, and a DA, which sets the details of the capture. QuickShot works in all varieties of color, including 32-bit. It also claims to work under A/UX.

You can send captures to your printer, a disk, or the Clipboard, and set the program to capture the whole screen (main one only), a user-selected area of the main screen, or the active window. Menus can be shown if desired. Disk files are saved in either MacPaint or PICT/PICT2 format. You can even add basic System information to the capture. Add the time and date, and eliminate the corner marks that most capture programs catch. Performance is generally excellent.

BCI Boston Companies, 15 Wake Robin Road, Sudbury, MA 01776; (508) 443-0075. Version 2.1. \$89.

Say Goodbye to Financial Hassle!





hy waste time doing your finances? Quicken slashes time and effort every month...perfectly organizes your finances...and provides instant insight into your money matters.

#### **Breeze Through Financial Chores**

Quicken takes the drudgery out of routine finances. It automates everything from bill paying to bookkeeping...reconciliation to reporting. Ouicken does in minutes what used to take hours.

Quicken actually learns your regular bills. Just confirm payment amounts, and in seconds, Quicken performs 14 bookkeeping steps, categorizes expenses, and hands you printed checks addressed for mailing. And, Quicken keeps perfect records of all your handwritten checks.

#### A Bigger Picture with Smaller Effort

Quicken automatically organizes your finances. Imagine always knowing how much money you have...and exactly where it's going. At the click of a button, Quicken generates insightful reports such as Income and Expense, Cash Flow, Budget vs. Actual, Job Costing, and more.

#### Relax at Tax Time

Stop dreading tax time. Quicken keeps

important tax data at your fingertips automatically. In seconds, you can print an itemized list supporting your deductions. Plus, Quicken links directly to top selling tax software like MacInTax\*

#### **NEW VERSION 1.5** FAR MORE THAN A CHECKWRITER

- · Far more flexible reports:
  - · Multi-column reports show spending and profit trends over time
  - A/R aging and customer history reports
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Quicken is the best selling business and personal finance software in the world. Ken Landis of MacUser gives Quicken the



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SPECIFICATIONS
Software Compatibility: Exports to SYLK, Text, Excel,
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# StartUp

# Pinstripe Picks

BY ROBERT R. WIGGINS

## **Multi-Ad Creator**

Multi-Ad Creator is very unusual; it's a vertical-market product that offers features you'd expect to find in high-end page-layout programs — and then some. Multi-Ad Creator is a page-layout program designed especially for laying out advertisements. It's oriented toward single-page layouts but does allow you to associate multiple layouts with an ad and even to display them side by side, which is very useful for prototyping.

When you first create an ad, you specify the ad size by selecting a standard size from the size database or by specifying a nonstandard size, which you can add to the database. Working on an ad is similar to working in Page-Maker, because Multi-Ad offers rulers, a desk area surrounding the page, and floating palettes. The tool palette

offers some tools not found in PageMaker, though, such as the rotation, starburst, and border tools, and even an art-block tool for creating placeholders for art that will be pasted in later. Multi-Ad Creator fully supports color, and with

the color palette, you can add color to any element of an ad.

Multi-Ad Creator supports MacPaint, RIFF, PICT, EPSF, and five kinds of TIFF files. In addition, you can create graphics by using the tool palette. You can import text from text, WriteNow 1.0, MacWrite 4.5, Microsoft Word 3.0 (not fast-saved files), and RTF files. Text can flow across multiple linked text blocks. You have just about every text-formatting option imaginable, and there's even a thesaurus (Microlytics' Word Finder).



All the formatting options can be combined into style sheets.

Multi-Ad Creator isn't perfect. Its single-page orientation is a big drawback if you do many multipage spreads or inserts. But even if you own PageMaker or QuarkXPress, you should consider Multi-Ad Creator if you do a lot of ad layout or prototyping. The program may do only one thing, but it does it very well.

Multi-Ad Services, 1720 W. Detweiller Drive, Peoria, IL 61615; (309) 692-1530. Version 2.1. \$995.

# WriteImpact

Advanced highquality printers can't do multipart forms. For such forms, you still need an impact printer.

The WriteImpact is GCC's entry in the near-letter-quality impact-printer market, and it's not bad. It's excellent at paper handling, offering both push and pull tractor feed as well as friction feed. Print quality is good.

The WriteImpact comes with its own Chooser-level printer driver that supports its special features, such as font smoothing, bit-map smoothing, scaling (25 to 400 percent), print preview, and kerning. You also get Quick-Spool II (a background spooler) and GCC's Print Manager for dealing with the batch-mode print queue. The WriteImpact uses special Bitstream fonts to achieve its high quality. They take up disk space (about 65K per font and style), and not every popular



## Tefax RA2110M

It's a great idea: A Group 3 standalone fax machine with a serial-port interface so it can also act as a fax modem, thermal printer, and 200-dpi scanner. Unfortunately, the implementation is not as good as the idea. The Tefax is a good midrange fax machine, but it comes with a high-end price without such almost mandatory high-end features as a paper cutter. Plus, the BackFax software that comes with the Tefax can most charitably be described as quirky; it sometimes loses connection with the Tefax and requires a system restart to get going again. The documentation is also lacking.

When the BackFax software works properly, the Tefax is an amazing machine. But it can't double as your only printer or scanner. The 200-dpi resolution isn't as good as it sounds, and the Tefax is a thermal-paper device. With better software and a lower price, the Tefax RA2110M would be an outstanding performer, but at the current price, you'd get a better value by buying a stand-alone fax machine (with a paper cutter) and a separate fax modem. Keep an eye on Relisys, though. The Tefax is a good start toward integrating a fax machine with a fax modem.

Relisys, 320 S. Milpitas Blvd., Milpitas, CA 95035; (408) 945-9000. \$1,595. screen font has a corresponding Bitstream font. Fortunately, the WriteImpact works fine with Adobe Type Manager, which makes all the Adobe fonts usable.

The WriteImpact is a good value for the money. You get ImageWriter LQ quality at an ImageWriter price (and without the problems of the LQ). The WriteImpact's only major drawback is that it's a serial device with no networkable AppleTalk version.

GCC Technologies, 580 Winter St., Waltham, MA 02154; (617) 890-0880. \$699.

#### **PINSTRIPE PICKS**

BUSINESS BOOKSHELF

# **Encyclopedia Macintosh**

Craig Danuloff and Deke McClelland set out to create a Macintosh reference book and ended up with an excellent book and a useful Hyper-Card stack (sold separately). The book and the stack are divided into three major functional areas: System Software and Utilities, Applications, and Hardware. Within each area, the information is organized alphabetically. Both print and stack versions include additional information about books, magazines, and vendors, and both have a glossary. The book includes sections on bulletin boards and user groups that the stack omits, and the stack has an excellent

ence on software that is not possible in book form.

If you're a power user, you can probably get by with just the stack, which is more useful as a quick reference. If you yearn to be a power user, the book format is better for learning and absorbing the large amount of information. Either version makes a good reference tool; together they make an unbeatable combination.

Book: Sybex, 2021 Challenger Drive, #100, Alameda, CA 94501; (415) 523-8233. \$24.95. Stack: Heizer Software, P.O. Box 232019, Pleasant Hill, CA 94520; (415) 943-7667. \$50.

# MediaMap

MediaMap is a directory of almost every possible press contact, from the computer press to some major user groups. Each entry is several pages long and typically includes a capsule summary, an overview, demographics, an editorial profile, an editorial calendar, and an annotated masthead telling



## **NewsTrack**

NewsTrack is a dedicated public-relations database application created with Double Helix II (a run-time engine is included with the package). It's a specialized set of interrelated relational databases with different "views" (called "users") that depend on what you want to do. The main user is NewsTracker, which you use to track media contacts, exposures, and follow-ups and to

maintain a media log. ClientTracker lets you track your client companies, contacts, and billings. Index-Maker lets you define media types, categories, and two subcategories. MailMerger is for creating custom form letters that don't look like form letters, and it can interface with Microsoft Word if you need the additional power of a dedicated word processor.

The hardest part of keeping track of the media contacts is the data entry required to store the names, addresses, and phone numbers. If your target market is the computer industry, you can get a special version of NewsTrack preloaded with information from Media-Map (see review on this page).

NewsTrack is well thought out and executed, although it requires extra time and training to learn all its ins and outs. To use it, you may have to adapt the way you work, but it may meet your needs exactly.

Right Brain, 420 N. 5th St., Suite 970, Minneapolis, MN 55401; (612) 334-5620. Version 1.1. \$495. you who the people are and what their interests are. There is also the Update Memo, which highlights changes in the Computer Industry Report (such as the addition of Pinstripe Picks to MacUser).

The disks include Contacts on Disk, ASCII text files of selected contacts from the Industry Report, including separate additions and deletions files so you don't have to reload the database for every update, and the WorkDisk Template, a set of FileMaker database templates into which the Contacts on Disk can be loaded. You can create your own databases too or get a special version of NewsTrack that comes preloaded with MediaMap (contact Right Brain for details).

If you're in advertising, public relations, or marketing and need to keep up with the computer-industry press, MediaMapis exactly what you need.

MediaMap, 130 The Great Road, Bedford, MA 01730; (617) 275-5560. Version First Quarter 1990. MediaMap Research System, \$1,695 per year; Contacts on Disk, \$300 per year.

## **FlowMaster**

If you're in advertising, public relations, or marketing, odds are you've had to work with a media flowchart. FlowMaster makes media flowcharting so easy that it's almost a plea-

sure. You enter the information, and FlowMaster keeps track of dates, costs, and rating-point totals, both overall and for any flights (families of related ads within a given campaign) you define. FlowMaster can also produce bar charts of media activity. FlowMaster has an on-line help function, and it's easy to learn and use.

FlowMaster can import and export text files of weekly media activity and is able to access stored media-cost files to reduce data-entry



requirements. The amazing part of FlowMaster is that after it creates your flowchart or bar chart, it gives you a full-color drawing environment so you can dress up your chart with text and

graphics. You can highlight situations or flights that worked exceptionally well (or poorly) or just make the charts prettier.

Like Multi-Ad Creator, FlowMaster is so good it's hard to believe it's a vertical-market product. If you ever need to make a media flowchart, you must try FlowMaster.

Telmar Information Services, 902 Broadway, New York, NY 10010; (212) 460-9000. Version 2.01. \$795.

Where savings are huge and advice is free.



#### **Purchase orders** gladly accepted



#### 1stAid Software, Inc.

A package no hard disk user should be without. Includes 1stAid Kit (complete Mac troubleshooting, including file & disk recovery), Complete Undelete (ultimate utility for recovering trashed files), and Sector Collector (safeguards data on hard disks by isolating bad sectors).

Deluxe 1stAid Kit .....\$116.



#### Adobe Systems

How to find a face in a crowd: If you're tired of searching your crowded font menu for a particular typeface, just place Adobe Type Reunion in your system folder and your typefaces are auto-matically alphabetized and conveniently sorted by family name and weight. Once and for all.

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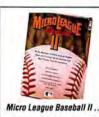
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tegory	External Drive	External Drive	External Drive	External Drive	External Drive	External Drive	External Drive
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EM Mechanism	Seagate ST125N-1	Seagate ST157N	Quantum ProDrive 405	Conner 3040	Seagate STI 57N-1	Seagate ST1096N-1	Quantum ProDrive 80
rmated Capacity	20.1 MB	47 MB	40 MB	40 MB	48 MB	20.1 MB	78.8 MB
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anufacturer	Peripheral Land, Inc.	Dolphin Systems	Dolphin Systems	Dolphin Systems	Peripheral Land, Inc.	Dolphin Systems	Peripheral Land, Inc.
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ormated Capacity	105 MB	102 MB	102 MB	173 MB	251 MB	330 MB	327 MB
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	Turbo Backup,	& Shareware,	& Shareware	& Shareware	Turbo Bockup,	& Shareware	Turbo Bockup,
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	Quantum 40	Quantum 80	Quantum 105	Flipper 44	Infinity 40	Infinity 40/40	Infinity Option
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rmated Capacity	39.4 MB	78.8 MB	103 MB	43 MB	42.5 MB	42.5 MB/42.45 MB	573 MB
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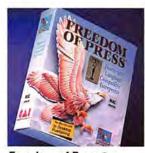
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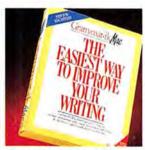
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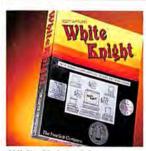
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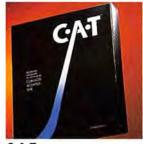
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# Start Up

# **REVIEWS**

MATHEMATICS

# Theorist

#### A young whiz kid deposes Mathematica to reign as the new king of math programs.

e<sup>2πi</sup> Anyone who was excited by the introduction of Wolfram Research's Mathematica two years ago should be bowled over by Theorist, an elegant new equation-manipulation program from Prescience. Using click-and-drag equation manipulation, 3-D color graphics, and animation, Theorist surpasses Mathematica in ease of use; practical functionality; and, in some cases, accuracy.

You can use Theorist with imaginary numbers, differential and integral calculus, and matrix algebra (along with other branches of math) in three ways: to solve and manipulate equations; as a tool for visualizing your equations and theories through graphs and animation; and as an educational tool for presenting math and science concepts. In each case, the interface is straightforward, with a variety of options.

**EXCELLENT EQUATIONS** You can enter equations by typing, using the tool palette, or employing a combination of both. On-screen, equations — consisting of symbols, superscripts, and subscripts — look exactly as they did for the 300 years before the advent of the computer. (Computer-science devotees can also display their equations in a FORTRAN-ish format by selecting that option.) Theorist also aids equation entry by automatically adding punctuation.

A solution to a problem in Theorist can be a numerical answer, a class of equations, or a graph. With Theorist, the equation-derivation process is clean and pure, requiring no programming. Simplifying expressions involves a single menu command.

The powerful click-and-drag manipulations are deceptively simple. For instance, to solve for x, merely select x and while holding down the Option key, drag to the symbol preceding the equation. To perform a substitution, do an Option-drag of a phrase to the variable in another equation. Option-drag also works with

moving expressions to the other side of equations.

These manipulations are handy for solving simultaneous equations in multiple variables or for solving an equation such as tan(x) = sin(2x), which has x on both sides. In Mathematica, this equation produces an error message followed by the empty set as a solution. Using Theo-

rist's equation-manipulation tools, you get the first answer, which is  $\pi/4$ . You can also get a set of all solutions by turning on Auto Casing in the Prefs menu.

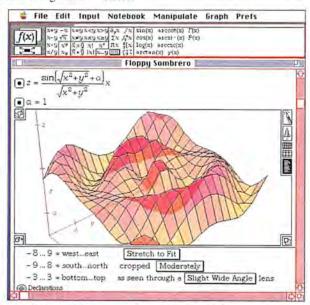
Menu versions of these operations are also available in the Manipulate menu. Other commands in this menu are Factor, Expand, Taylor Series, and Integration by Parts.

#### RULES OF THE GAME

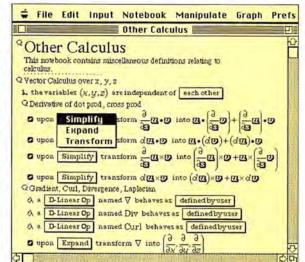
One of Theorist's most powerful aspects is the fact that it is not procedural. Definitions of math terms, rules, and transformations appear in one of several types of Propositions. These can be copied and pasted between files, and you can write your own.

One type of Proposition is the Name Declaration, represented by a flag icon, which defines terms as constants, variables, functions, or operands. The use of infinity ( $\infty$ ) in expressions is supported in the default declarations created with each new Theorist file, called a notebook.

Transformations are rules that act on terms in your equation. Creating them is simple: Type your function, select it, and pick Transform Rule from the Input menu. Using a pop-up menu, you can designate a transformation as one of three menu commands: Transform, Simplify, or Expand. When you use one of these commands on an expression, Theorist knows which rule to apply; you don't even have to know what the function is called.



Theorist is a math processor for real mathematicians — witness the familiar-looking equation at the top. The window below the graph can be used to change such aspects of the plot as the range of data plotted, the color scheme, and the degree of transparency.



Here's an example of different Propositions in one of Theorist's function notebooks. The user can assign the Simplify, Expand, or Transform commands from the Manipulate menu to this transformation. The flag icons indicate Name Declarations.

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# StartUp

## REVIEWS

Theorist's special function Transformations come in separate notebooks. In comparison, Mathematica has a few moresophisticated functions, such as additional Bessel functions, and has more automatic integration functions. However, one problem with Mathematica is that it loads everything in at once, resulting in 3 to 4 megabytes of code. With Theorist, you copy only what you need into a particular notebook file or add your own.

VISUAL MATH Plotting is a simple matter of choosing the form of a graph from the Graph menu, such as y = f(x), x = f(t). or z = f(x,y). Theorist can plot in a variety of 2-D or 3-D coordinate systems, including Cartesian, logarithmic, polar, and cylindrical. Details of the plot can be altered in a pop-up window beneath the plot.

Theorist uses graphs to find the root of an equation: You zoom near the desired root and choose Find Root from the Graph menu. Although Mathematica's precision goes beyond Theorist's 19 decimal places, Theorist's root method is more accurate than Mathematica's purely numerical method. This is illustrated on page 3 of Stephen Wolfram's Mathematica book, in which an example asks to find the root of a Bessel function near 10.5. Mathematica's answer is 18.071. while Theorist returns two values that are closer: 11.792 and 14.931.

The graphics-manipulation tools are some of the best in any graphics program. If the graph displays an x-axis range of 0 to 10 but you want 20 to 30, just click and drag the plot to the left within the graph window. 3-D manipulation requires no special tool and is one of the easiest methods in any 3-D program; clicking on a 3-D graph yields the outline of a rectangle, which can be rotated in any direction by dragging.

Animation is equally simple. After you choose the graph and the variable to be changed, the Animate window from the Graph menu lets you specify the range of

Theorist tttt

Published by: Prescience, 814 Castro St., San Francisco, CA 94114; (415) 282-5864. Version: 1.01.

List Price: \$379.95.

the variable, the number of frames, and the frames to be displayed per second. Animations can be saved for use later.

Theorist comes in two versions: one for the Mac Plus and SE, and the other for the SE/30 and the Mac II family that takes advantage of the math coprocessor. I tested both versions without problems. Theorist even ran on a 1-megabyte Mac Plus under MultiFinder, as long as 600K of RAM was available. Animations were slow on the Plus, but they did run. The well-organized manuals, with examples on almost every page, also get high marks.

THE BOTTOM LINE Besides having extensive features, Theorist is a wellthought-out, well-programmed application that does math the old-fashioned way; with real equations, I don't do a lot of math here at MacUser, but after seeing Theorist, I almost wish I did.

— John Rizzo

WORD PROCESSING

# Grammatik Mac and Correct Grammar

Used prudently, either of these powerful proofreading programs can improve your prose.

Writing is a difficult art, and writers have traditionally turned to editors and proofreaders to tend to the mechanics of language so they could concentrate more on content. Spelling checkers can obviously proofread for spelling, but editing

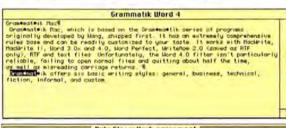
and much of the rest of proofreading are complex, judgmentladen arts consisting of much more than merely catching spelling errors.

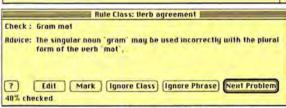
There have always been programs that claimed an ability to edit and proofread. Those for the Mac have generally been awful, making suggestions based on a limited rule set or knowledge base. If that wasn't restrictive enough, these early efforts could

only offer suggestions, without being able to print them out. Inserting the corrections and modifications into your work was a separate manual task,

Two new programs buck this tradition, offering reasonable editing, proofing, and correcting. Both are low in cost and fairly quick and easy to use.

GRAMMATIK MAC Grammatik Mac, which is based on the Grammatik series of programs originally developed by Wang, shipped first. It has an extremely comprehensive base and can be





Grammatik Mac is a powerful proofreader, but it's plaqued by a Word 4 filter that doesn't work reliably and a clunky interface. As you can see, it has rules for just about everything.

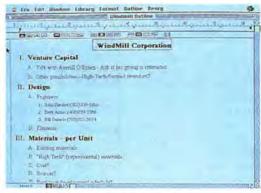
> readily customized. It works with MacWrite, MacWrite II, Word 3 and 4, WordPerfect 1.0.3, WriteNow 2.0 (saved as RTF only), RTF, and text files. Unfortunately, the Word 4 filter isn't particularly reliable, failing to open normal files and quitting out of the application about

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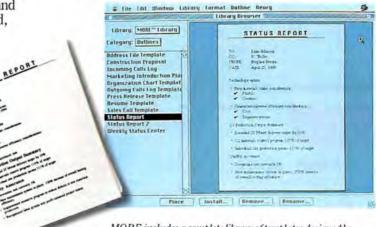
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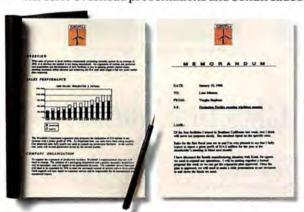
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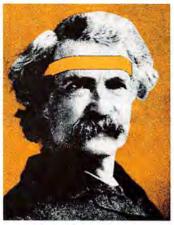
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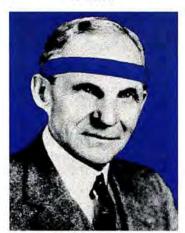
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# **Start Up**



half the time, as well as misreading carriage returns.

Grammatik Mac offers six basic writing styles: general, business, technical, fiction, informal, and custom. Each loads a slightly different rule set, and you should try each style, using the same type of document to find out which works best for you. (I find general is best for me for all documents, including both the most formal and the most technical.) You can customize rules to your liking — but be prepared for some very busy dialog boxes when you set your rules.

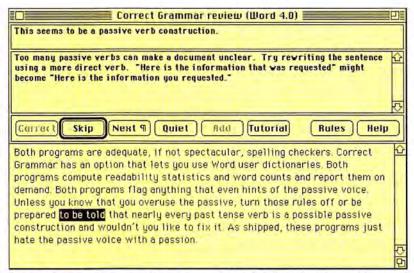
The overall interface is clumsy and poorly thought out. For example, the Open and Save buttons are incredibly ugly and reminiscent of PCs. Save works awkwardly. If you don't click on it, it will automatically save the corrected file with the same name as the original. It does preserve the original file by adding the suffix \*Old to the filename, but it's easy to get confused.

Grammatik Mac checks nearly everything and has rules for virtually anything. For my taste, it overdoes things, and if I accepted all its suggestions, my results would be overly dull and dry. It might be correct grammar, but it wouldn't be good writing. The solution is to take the time to heavily customize your copy of Grammatik Mac, Grammatik Mac comes with a complete manual and a separate book of writing advice.

correct Grammar's rule set and checking engine are based on a system developed by Houghton Mifflin. Its rule base isn't as detailed as Grammatik's, but it is more flexible, putting it a bit more in tune with today's grammar. A nice touch is the option to automatically create a backup copy of the original file before any checking starts. That's an excellent safeguard.

Correct Grammar works with MacWrite; MacWrite II; Word 1.5, 3, and 4; WordPerfect 1.0.3; WriteNow 2; QuickLetter; Acta: Acta Advantage; AppleLink; and text files. It has a nice interface, and use is intuitive. Some users may find the small size of the type in the context window a drawback; neither the type size nor typeface can be modified.

Most of your actions are controlled from a well-designed set of buttons that runs across the middle of the correction area. With the Quiet button, you can turn off a particular rule, permanently or temporarily. This feature makes customizing your copy of Correct Grammar



Correct Grammar isn't as powerful as Grammatik Mac, but it's easier to use and is more in line with today's grammar. You control most of your actions from the row of buttons you see here.

exceptionally easy. That's a relief, because the other place where you customize Correct Grammar is in the Rule Classes dialog box, one of the busiest, most complex dialog boxes I've ever seen.

Correct Grammar is a bit better at checking for readability than is Grammatik Mac. That's because you can more finely tune its readability-checking tests. You'll need to refer to the manual, however, to find out exactly what each element in the tuning dialog box does. The manual is good although not quite equal to the Grammatik Mac manual.

Both programs are adequate, if not spectacular, spelling checkers. Correct Grammar has an option that lets you employ Word user dictionaries. Both programs compute readability statistics and word counts and report them on demand. And both programs hate the passive voice (Strunk and White fans, rejoice). Unless you know that you overuse the passive, turn those rules off, or else prepare yourself for being told that nearly every past-tense verb is a possible passive construction, Correct Grammar also includes a book on sound writing.

THE BOTTOM LINE If you think you can benefit from a proofreading program, get Correct Grammar unless you have a specific reason for doing otherwise. It has fewer rules and features than Grammatik Mac but is more than adequate for most writers. It's also better behaved and has a much better interface. Correct Grammar is much easier to use than Grammatik

Mac, requiring less clicking and mousing to reach the same ends, and it's also far less likely to do things that you neither want nor need done.

And keep in mind that these programs are here to make suggestions about your work, not write your material for you. If you use them carefully, your writing may improve. If you follow them blindly, your writing will almost certainly suffer. Though rules can be helpful, they're also meant to be broken.

- Steven Bobker

#### **Get Info**

#### Correct Grammar

Published by: Lifetree Software, 33 New Montgomery St., Suite 1260, San Francisco, CA 94105; (415) 541-7864.

Version: 1.0. List Price: \$79.

#### Grammatik Mac ‡‡‡‡

Published by: Reference Software International, 330 Townsend St., Suite 123, San Francisco, CA 94107; (415) 541-0222.

Version: 1.0. List Price: \$99.

# Start Up

INPUT DEVICES

# Wacom SD-510 Cordless Digitizer

Wacom's thin, pressuresensitive digitizing tablet does away with bulk weight, cords, and inconvenience.

When it comes to graphics, a digitizing tablet offers the most flexibility of any Mac input device — especially in a graphics shop. Most tablets are serviceable, but many are expensive and bulky and require that the pen or puck (a mouse-like device) be connected with an



The light and pancake-thin Wacom SD-510 tablet uses a pressure-sensitive stylus that doesn't need a cord or batteries.

unwieldy cord. Cordless pens exist, but they're generally heavy, oddly shaped, or both. The Wacom SD-510 Cordless Digitizer breaks away from the rest of the pack by doing away with all those inconveniences while delivering accuracy, ruggedness, performance, and a unique dimension — pressure-sensitivity.

The tablet, merely .25-inch thick, connects with a slender wire to an interface box that plugs into the Mac's modem port. The box is powered by household current. Of necessity, your modem port

will be occupied while you use the tablet, so if you have other serial devices, such as modems or printers, on that port, you'll have to buy an A/B or A/B/C-type multidevice switch — provided you can find one with a mini-DIN-8 connector.

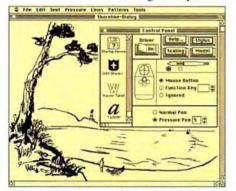
**STYLISH STYLUS** Wacom's stylus is cordless, batteryless, and light, and it resembles a pen. Its incredibly simple mechanism is inherently rugged and kidproof. A variety of programs can use the stylus' pressure information to vary color intensity, brush thickness, line



## **REVIEWS**

width, and transparency; to navigate through drawing layers; or to control whatever aspect the software is programmed to vary. A non-pressure-sensitive side-button stylus and a four-button cordless puck are optional.

Cordless pointer operation is possible because the stylus picks up electromagnetic signals from the tablet's surface, modifies them according to its position



The Wacom's software lets you specify the screen area you want to control and how much of the tablet to use as the sensing area. and pressure, and sends them back to the tablet, where they are sensed and processed. Its 9.4-x-12.8-inch actual surface has a 6-x-9-inch sensing area with a resolution of 770 lines per inch at an accuracy of .002 inches. Wacom's tablet is much more responsive than a mouse. You can dash off strokes at natural speeds — even your signature can be captured. The tablet's rapid reaction is due partly to the fact that it's not an ADB device, so it's free from ADB's slow transfer rate.

PRESSURE LUCK Although the Wacom tablet works with all software as a pointing device, newer graphics applications — such as ColorStudio, Photoshop, SuperPaint, and UltraPaint — have specific tools that respond to pressure. Other uses for Wacom's pressure-sensing technology include fabric design and real-time handwriting recognition. Its software bundle includes Pressure Paint, a monochrome paint application that uses pressure feedback to vary the brush width or the darkness of the paint pattern. What's nice with any program is that you can set the pressure threshold that indicates a

mouse click — anything from a featherlight touch to an iron fist.

The SD-510 tablet is unobtrusive. When you aren't using it as a tablet, the tablet is an excellent mouse pad. Since it's not tilted, the occasional desk clutter won't slide off it and onto the floor.

THE BOTTOM LINE Because of its responsiveness, diminutive design, ruggedness, and price, I highly recommend the Wacom SD-510 to anyone who wants or needs a more natural stroke than what a mouse can deliver.

Salvatore Parascandolo

### **Get Info**

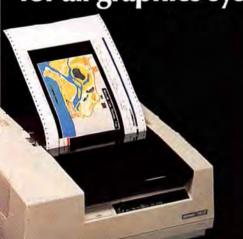
Wacom SD-510 Cordless Digitizer \$\$\$\$

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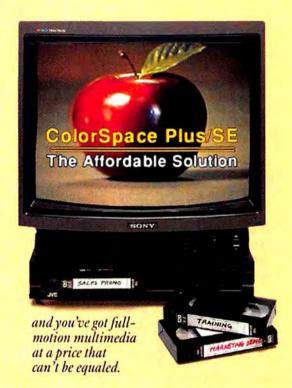
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PAGE LAYOUT

# DesignStudio

# Letraset's upscale page-layout program boasts features and frustrations galore.

On confronting DesignStudio, one's first impression is that Letraset has simply beefed up Ready,Set,Go! (RSG) and upped the price. However, DesignStudio adds new and welcome tools for layout management and for handling text, graphics, and color. It's a world beyond RSG, which Letraset still sells and supports. Unfortunately, DesignStudio is also slow, has WYSIWYG limitations, and has too rigid an interface.

LAYOUT TOOLS Instead of the rectangular grid RSG uses, DesignStudio offers parallelograms that can be resized even disproportionally — but not reshaped using vertices, the way polygons can be.

You can freely position an object; have it snap to guides; nudge it with the arrow keys; and specify its exact location, size, rotation, and a host of other attributes in the Specifications dialog box — a level of precision comparable to that of QuarkXPress. Undoing the manual resizing of a picture frame and its contents, however, returns only the frame to its

original size — the contents remain scaled!

DesignStudio offers free rotation of any element or group around any center in .1-degree steps - at a price. First, you can't undo a rotation except in a dialog box. Once you have rotated or flipped an element, it breaks up onscreen and you lose substantial editing freedom: You can crop or scale it only

nd objects, a crop or scale it only by using the Object specifications dialog box and typing in a new size or scaling factor. A rotated polygon can't be reshaped until it's rotated back to zero degrees.

If you place a PICT2 drawing that contains text, such as a map or a chart, and then rotate it, the text prints smoothly. But if you opt to print PICT2 colors as grays, as you might with a LaserWriter, the embedded text prints as it appears onscreen: as a coarse bit map.

Rotated text blocks also have their surprises. To edit rotated text, Design-Studio temporarily sets it back to zero degrees and removes any special vertical justification until you finish editing. This makes fine write-to-fit tweaks difficult.

One result of all the rotations, unrotations, and other updates is complete, slow screen redraws. DesignStudio redraws the screen even if you have changed only a small element or answered a dialog box.

As a shortcut, you can use glossaries to save both graphics and text items for reuse. Once you've stored a glossary item, you can insert it into the layout by using a preassigned keystroke or by selecting its name from a scrolling list.

WORKING WITH TEXT Text can be either typed in directly or imported. Microsoft Word 1.05, 3.01, and 4.0; Microsoft Works 2.0; WordPerfect 1.0.1; WriteNow 2.0; MacWrite; and MacWrite II, as well as tagged text (with formatting codes) and plain-text files, are supported. Multiple foreign languages are supported in a single layout, and DesignStudio applies the appropriate spelling dictionaries and hyphenation rules to each. The built-in spelling checker is workable but clunky.

To set text attributes, you go to the Format menu (not the Text menu). You can set attributes such as font, style, and size individually or simultaneously by using the Type Specs dialog box. But all your changes are for naught if you don't first remove any named style that may be in effect. You do that on the Edit menu (where else?). Styles, however, are defined and edited on the Document menu.

To create a style sheet, you use essentially the same dialog box that's used for Type Specs, but you name the collection of attributes. Unfortunately, you can't base one style on another or designate that one style will always follow another. You can, however, create a style with the collective attributes of a selected chunk of text or copy the style of one block and apply it to another block. Styles can even apply to individual characters, and multiple styles can be cumulatively applied to selected text.

Text can wrap around a graphic or other text, with the option of suppressing wrapping altogether for individual items. There is no provision for a custom-shaped wrapping border. DesignStudio supports several kinds of vertical text justification: flush with the top or bottom of the text block, centered within it, filling the block by spreading lines evenly and adding space only between paragraphs.

WORKING WITH GRAPHICS Design-Studio includes a polygon/polyline tool, with polygon editing that works like that in MacDraw II. The full range of Pantone colors is supported, as are custom colors



DesignStudio is Letraset's flawed, upscale page-layout package. Its special talents include free rotation of text and objects, a variety of shapes for text and picture frames, and lines with arrowheads. The polygon tool helps with light graphics.

an optional column-guide mode that lets you work in a more-traditional-looking layout environment. Column guides can be set up and altered only on the left and right master pages. Other guides, vertical and horizontal, can be pulled from the rulers and affect only the current page. Surrounding the printable page zone is a pasteboard area that holds extra layout elements from all pages. You can group and ungroup elements, move them forward or backward in the overall stack, and lock them into place — with a nonintuitive Command-U.

Text or picture blocks can be 1 of 16 shapes, including ovals, triangles, and

# ead It And Reas

Memo To: Mac people who would like to write better

From: Ken Dickens, ad writer

 ${f Re:}\;\;$  A great new product, a helpful book, and a contest to get both  ${\it FREE}\;$ 

'm a skeptic. So when the people at Reference Software told me Grammatik Mac could

improve my writing. I said, "Right." Faster, fontier, or even bolder I could believe, but better? Give me a break. I thought, if it was real good, it might help business people write better letters or memos.



Then again, I do this for a living (not a bad one I might add). So if software can improve my writing, it's fantastic. And I'm not.

Well, two weeks and a whole lot of humble pie later, I'm here to tell you that Grammatik Mac is nothing like those desk accessory style checkers you might have tried. Believe me, it's like an English professor in a box. The thing actually proofreads each sentence and breaks it down into parts of speach. It's scary, remember sentence diagramming? Well, that's basically what it does right on your screen.

I guess that's how it knows if subjects and verbs are in agreement. Prepositions are dangling. Plurals should be possessive. All that stuff I can never remember and have to look up. For example, Grammatik might stop on a sentence like "I feel I should have won the Grammatik Mac Contest, its a real shame", tell you that "feel" is probably

incorrect, suggest "think" instead and by the way, "its" should be "it's ." You can ignore the suggestion and move on (which is what I usually do, making the excuse that it's my writing style) or change the offending phrase right then and there. I like that. It lets me fix my mistakes without cramping my style.

Grammatik Mac catches errors like incomplete sentences, improper use of homonyms (like "their" instead of "there"), split infinitives, noun/modifier disagreements, passive voice, and etc. It even flags unbalanced punctuation, transpositions (like form instead of from, capitalization errors, and thousands of others I've never even heard of.

So, what's it done for me? Nothing short of making my writing better. And the more I use it, the

fewer mistakes it catches (could I be learning something here?). Anyway, I'm happy to report that I I almost never write in passive voice, that I've solved my its/it's problem, yet I still



split lots of infinitives. And I always start too many sentences with and. . . but, that's just my style.

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Reference

# Start Up

using the RGB (red, green, blue), HSV (hue, saturation, value), or CMYK (cyan, magenta, yellow, black) models.

DesignStudio imports monochrome and full-color graphics in the TIFF, RIFF, EPSF, PICT, PICT2, and MacPaint formats. You can tweak a gray-scale TIFF or RIFF picture in the Image Control dialog box, which can modify screen frequency and angle, contrast, and brightness, and which allows use of a gamma curve for fine gray-value control.

Unassisted, DesignStudio produces only spot-color separations. You can, however, make four-color separations by using StudioLink, an interface to a highend Crosfield system. A \$395 separation utility, DesignStudio Separator — which should be available by the time you read this — should address most other needs for separations on PostScript imagesetters from Linotype, Optronics, Agfa Compugraphic, and others. It will be able to color-separate native elements as well as TIFF, EPSF, and PICT2 images.

Annexes are DesignStudio's version of plug-in tools. You put them into a special folder, and their capabilities appear in menus and dialog boxes. Five annexes ship with version 1.0: Auto Kern Specs, Auto Track Specs, Fonts Used, Pictures Used, and Strip Fonts.

THE BOTTOM LINE DesignStudio offers features that make page layout more self-contained. If you're a Ready, Set, Go! user who's ready to move up, do it.

The manual needs work; it's condescending, repeats itself excessively, and references other sections far more often than necessary.

DesignStudio needs to make its layout process faster and less bound by its interface rules and inconvenient prerequisites. If you're still shopping for a dream layout package, wait for the new versions of QuarkXPress (see "BetaWatch" in this issue) and PageMaker before making your decision.

- Salvatore Parascandolo

### Get Info

#### DesignStudio \$\$\$\frac{1}{2}\$

Published by: Letraset, 40 Eisenhower Drive, Paramus, NJ 07953; (800) 634-3463. Version: 1.0.

List Price: \$795.

#### PAGE LAYOUT

# RagTime

## The Swiss Army knife of page-layout programs still needs a few more gadgets.

You may never have heard of it, but RagTime is one of the best-selling Macintosh programs in Europe. Previously plagued by poor distribution, RagTime languished in oblivion in this country while our European cousins rejoiced in its power and versatility. Newly upgraded to version 3.04, it's once again making a stab at the North American market. But deciding just which market it belongs in is another matter.

THE RAGTIME MEDLEY RagTime is a chameleon. It could be described as a cross between QuarkXPress, Excel, and SmartForm Designer. For starters, like

QuarkXPress, it uses frames as the building blocks for page layout - you pour text into some frames and paste graphics into others. In this respect, RagTime is a page-layout program. RagTime also boasts a host of typographic-control and word-processing functions, complete with a sophisticated search-and-replace function, a spelling checker, and automatic hyphenation. In that respect, Rag-Time is virtually a word processor.

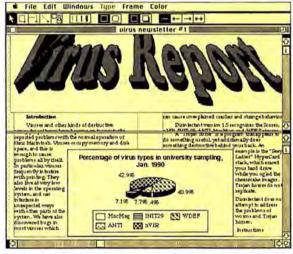
But there's more. RagTime also has frames for spread-

sheets and frames for charts based on the data in those spreadsheets. This makes RagTime as much a spreadsheet and graph package as anything else.

And that's not all. RagTime makes extensive use of what it calls tear-off forms, templates similar to MacWrite II's stationery documents and Page-Maker's master pages. You create the basic design of your document on the form, including items you want placed

automatically on each page. Thereafter, RagTime always opens a copy of the form, preserving the master. This feature, combined with spreadsheet frames and high-powered text commands, makes RagTime a respectable forms generator.

Clearly, RagTime is nothing if not versatile. It can do mail-merge, comes with drivers for four brands of scanners (Siemens, Agfa, Logitech's Scanman, and Apple), and can edit gray-scale images. RagTime also contains built-in hyphenation algorithms for both Spanish and English (but it can check spelling only in English unless you purchase the Spanish



RagTime is an integrated page-layout, spreadsheet, and formsdesign package. Its fortes include "hot links," such as the graph in the lower pane, which is dynamically linked to a spreadsheet frame (not pictured) in the same document. If you change the spreadsheet numbers, the pie chart changes automatically.

dictionary).

One of its snazziest features is the easy way it "hot-links" spreadsheet data into other RagTime documents. For example, it's easy to embed a calculated field in a paragraph of text so that the field is automatically updated whenever you change numbers in the RagTime spreadsheet to which it's linked. Similarly, a bar chart can be updated whenever you change the underlying figures in another document.



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# OF MACS

# Up to Date

#### **Changes New and Noted**

SUPERCARD, Silicon Beach Software's hypermedia development environment, has had its first major upgrade, to version 1.5. Some of the new features are improved speed and memory management; ScriptTracer, a built-in debugger; real list fields; run-time creation of hierarchical menus; and real pop-up menus. The new version also offers run-time menu editing. color text, an improved run-time editor, and on-line help. Some additions and changes have also been made to the SuperTalk language. \$299; upgrade, free to registered users. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126; (619) 695-6956.

AFTER DARK, Berkeley Systems' multimodule screen saver, has three new screen images in its latest edition. Version 1.1 also cleans up several incompatibilities with other INITs, including MultiFinder and QuicKeys, and the standard Command-Shift-3 sequence now works for taking screen shots. \$39; upgrade, \$5 shipping and handling to registered owners or free using an updater posted on many bulletin boards. Berkeley Systems, 1700 Shattuck Ave., Berkeley, CA 94709; (415) 540-5535.

PYRO!, the original fireworks show of a screen saver, has followed After Dark's modular model. Version 4.0 adds seven external screen-saver modules to the familiar fireworks and clock, including Aquarium (with swimming fish that eat each other) and Fireworks Too, a splashy variation of the original. Pyro! 4.0 is much more configurable than previous versions and includes an alternative Fkey capability for launching screen sleep. \$39.95; upgrade, \$15 for registered owners. Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809-4559; (504) 291-7221.

DOLLARS & SENSE, Monogram's popular personal-accounting program, is in version 5.0. The faster version now boasts savable custom reports and queries, a Finder-like icon-based interface, context-sensitive help, and a user-definable automatic startup sequence. It also offers a running balance of current and future transactions, custom check design, up to three checkbooks for each account, support for European date formats, and a year-to-date summary report. \$149.95; upgrade, \$34.95 to registered owners. Monogram Software, 21821 Plummer St., Chatsworth, CA 91311; (818) 700-6200.

MODAL RAGTIME RagTime integrates all these diverse functions into a single package by relying heavily on modes. There are five of them: text, frame, spreadsheet, graph, and picture. Each mode has its own menu bar and tool bar.

Highly modular programs are usually counterintuitive and non-Mac-like because they force you to

switch modes before you can do what you want to do. RagTime, however, does an admirable job of making the modes almost transparent by doing most of the mode switching for you. For example, when you click on a frame border, Rag-Time switches to frame mode, but when you click in a text frame, it moves to text mode. Rarely do you find yourself in the wrong mode at the wrong time. This intelligent and automatic use of modes gives you enormous versatility (you can check spelling in your spreadsheet, for example) without making you master a bewildering number of commands. Perhaps the most impressive example of intelligent mode switching is graph creation. All you do is copy numbers from a spreadsheet frame and paste them into a graph frame. Where numbers once were, a bar graph now appears.

RagTime's features are impressive, but it still suffers from some surprising gaps and rough edges. Perhaps to show off the fact that you can rotate text, both the tutorial and the reference manual are perversely printed sideways (the page numbers and index are normal). This design might work for quick-reference cards, but it's a nuisance in manuals. Also, the manuals are obviously British, even though the software itself has been Americanized; the British spelling is distracting. (The U.S. distributor says the manuals will be localized for the United States, but no date or upgrade procedure has been set.) Also, the tutorial is too long, lacks an index, and sometimes falls out of sync with what's really going on.

RagTime lets you anchor a frame to a specific point in the text so that the frame will always appear in the same place relative to the text. Anchoring is nice, but RagTime lacks full-fledged style sheets, a virtual necessity nowadays in DTP and high-end word-processing programs. You can kern, but you can't control tracking. You can import ASCII, MacWrite, WriteNow, and Word 3.0 files, but not MacWrite II, Word 4.0, or WordPerfect. You can embed spreadsheet functions in



RagTime sometimes reveals its European roots, as in this dialog box. (Weiter is German for Continue.)

an on-screen button, but there's no macro language and the program has only 80 built-in functions (Excel has half again as many). You can modify the three basic chart types (bar, line, and pie) in hundreds of ways, but you can't make a 3-D bar graph if your life depends on it. And at least two nonstandard interface elements drove me crazy: There is no easily accessible Page Setup command (it's buried in a Page Sizes box), and Command-P is not the shortcut for Print.

Perhaps an even greater problem is that you may find technical support hard to come by. My package didn't mention the U.S. support number — (415) 780-1800 — anywhere, but the company says that a card with the address and phone number is now included in every package along with a sticker on the manuals. There is also a potentially annoying protection scheme that prohibits two copies of Rag-Time with the same serial number from being used at the same time on a network — network administrators should take note.

THE BOTTOM LINE RagTime has definite potential for carving out a niche for itself. It is, after all, the only page-layout program that doubles as a spreadsheet program and can dynamically update graphs in your document. This feature alone should ensure it a following in this country, just as it has in Europe. But until RagTime incorporates real style sheets and can import the latest versions of Word and MacWrite files, many users will find themselves wanting more.

— Dave Valiulis

## **Get Info**

RagTime \$\$\$\frac{1}{2}\$

Published by: RagTime USA, 702 Marshall St., Suite 322, Redwood City, CA 94063; (415) 780-1800. Version: 3.04.

List Price: \$599.

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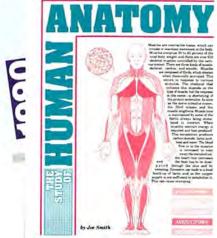
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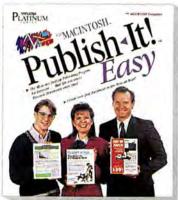
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TELECOMMUNICATIONS

# MicroPhone II

In version 3.0, the hacker's favorite telecom package is finally suitable for the rest of us.

MicroPhone has been power users' favorite telecommunications software since its first release, but novices found it overwhelming and even power users found it had a few lumps. MicroPhone II's predefined settings and scripts tamed the power somewhat and made it more accessible to novices, but there were still rough edges. With version 3.0, Software Ventures has finally achieved the proper balance between power and ease of use. The result is an incredibly powerful communications program for power users that anyone can operate immediately.

CALL ME MicroPhone II 3.0 comes ready to use right out of the package, with

extensive customized scripts for Compu-Serve (which gives it a Macintosh interface), and for BIX, Delphi, Dow Jones, EasyLink, GEnie, MCI Mail, and The WELL.

MicroPhone has always had one of the most powerful scripting languages available, and version 3.0 extends the power even further. The Watch Me facility still automatically builds basic scripts by watching you interact once with another system, and you can tailor scripts by using the script editor, which makes all scripting commands available at the click of the mouse. Complex scripting is possible with variables, DO groups and

IF/WHEN statements; reading from files; and even chaining to other scripts. Just about anything you can do from a menu can also be accomplished with a script command.

You can also assign color icons to your scripts for easier launching. The icons appear in an icon bar, and double-clicking on an icon invokes the scripts. You can even assign scripts to be executed automatically when settings files are opened and closed, to set things up beforehand and clean up after.

MicroPhone II's flexible scripting language supports the same XCMDs and XFCNs used in HyperCard, so you can either write your own or download new commands and functions from on-line services. MicroPhone II comes with a HyperCard stack, Dialoger for MicroPhone, that lets you create dialog boxes, complete with pop-up menus and scrolling lists, that you can use from your MicroPhone scripts.

MicroPhone II does an excellent job with file transfers, and version 3.0 adds

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## **REVIEWS**

Zmodem to the previously available Xmodem, Ymodem, Ymodem-G, and Kermit. It fully supports MacBinary II format and batch transfers. The Zmodem protocol lets interrupted transfers resume at the point of failure and offers improved throughput over other protocols. An XCMD that supports CompuServe's QuickB protocol is provided.

MicroPhone II's interface uses graphics well. For example, there are small icons at the bottom of the main window for halting and resuming the flow of text, for aborting scripts, and for controlling a built-in combination clock, calendar, and stopwatch. Script tracing is also displayed in this area of the window. You can even tell MicroPhone II to use a simple graphic display instead of the large standard dialog box to show file-transfer progress.

MicroPhone II still comes with Micro-Editor, a text-editing DA. You can also use an optional buffered keyboard window, which sits in front of the main window, so that your typing does not interfere with incoming text (very handy for real-time conferencing). There's a new script command called Message Box that displays a window and lets you create, read, edit, and save text files of up to 30K. This feature can be used to allow split-screen replies to messages in online-service scripts.

MicroPhone II 3.0 comes with new and improved documentation, a 200-page user's guide, a 400-page reference manual, and a 132-page guide to resources and utilities.

#### THE BOTTOM LINE

MicroPhone II 3.0 still isn't perfect, but it's a lot closer to perfect than it used to be. Screen updating is not fast and smooth

File Edit Settings Phone Scripts Transfer

Compuserve

10-Feb-90 12:46:45
Sb: #818171-#08 XCND - NP 3.0
Fris Software Ventures 7684,2181
To: Norty Silbernik 74375,303 (X)
Harty.

You will want to move the Quick8 XCND into the file named "NPloolBox", if you have setup more that one drive with MicroPhone, then you sight want to windste every copy of NPloolBox.

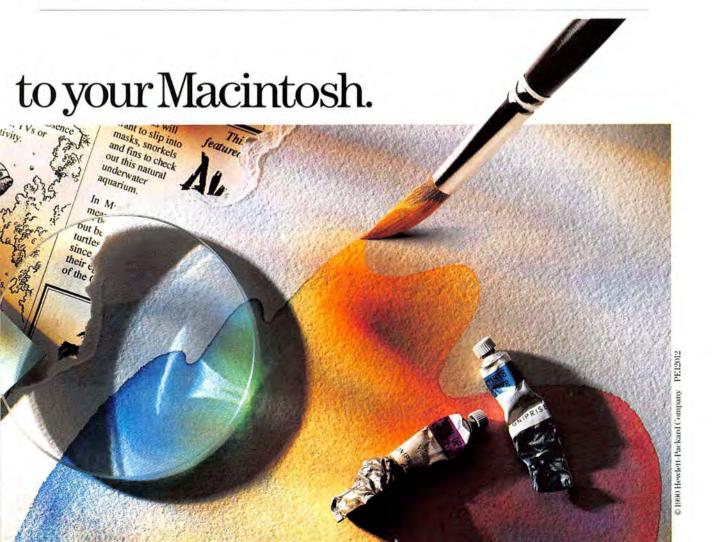
For the time being, you're best off using ResEdit to move the XCND. Please, be certain to make a backup of NPloolBox, before using ResEdit.

We're working on a generic XCND installer that will make this process much assier, and safer in the future.

Other

Version 3.0 of MicroPhone II finally tames the hacker's favorite telecommunications package. It comes with settings and scripts for most major on-line services that will help even the telecommunications novice get started quickly.

at high speeds (2,400 bps and above), especially on large screens or in full color. Script execution can be slow, and screen



## **Start Up**

updates slow substantially when a script is looking for text. None of these flaws are new — they're just the last major drawbacks in a program that has gotten better with each succeeding release.

MicroPhone has come a long way from its original hacker version. Version 3.0 strikes a balance between power and utility, including enough extensibility for users who pine for the days when telecom programs were hacked out of raw code, and enough preconfigured scripts for those who just want to get on with the job.

- Robert R. Wiggins

### **Get Info**

#### MicroPhone II 1111

Published by: Software Ventures, 2907 Claremont Ave., Berkeley, CA 94705; (415) 644-3232.

Version: 3.0. List Price: \$295. FINDER REPLACEMENTS

# DiskTop 4.0

## CE Software's indispensable Finder-DA reaches new heights.

DiskTop is one of those programs that should be on every Mac. It's the quintessential Finder/file-search/file-launch/file-hack DA.

LIFE AT THE TOP DiskTop 4.0 leapfrogs its closest competitor, DiskTools II from Evan Gross/Electronic Arts, in functionality and well-implemented features. Although not as aesthetically pleasing as DiskTools II, DiskTop 4.0 is built for speed, flexibility, and power.

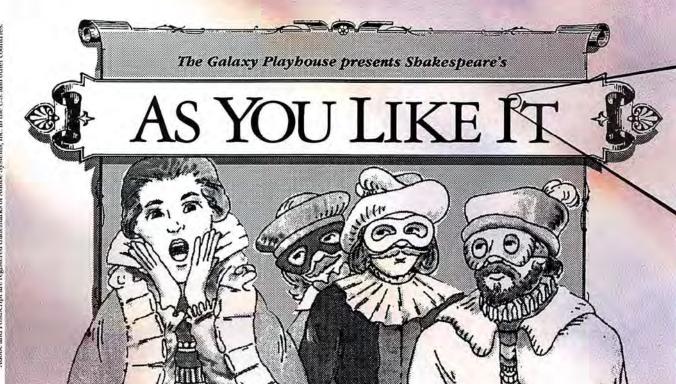
DiskTop now includes DiskTop.Extras (an INIT) and CEToolbox (a cdev), which let you use DiskTop's new DT Launch feature. DTExtras.Install takes care of adding the new files, and it also creates a Preferences Folder within your System Folder to house various settings.

DiskTop's Finder-type functions alone are worth its price. The DA lets you copy, move, rename, and delete files and folders as well as check the size of a file or folder, create new folders, eject/unmount floppy disks, set AppleShare privileges, shut down, and restart — all more easily than with the Finder.

You can choose between opening to the "disktop," an icon view of mounted disks and volumes, or to the Files Window, which displays files/folders in ways similar to the Finder's View By options.

DiskTop also provides access to the

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## REVIEWS

Get Info data for files and folders, adding a separate CE Info comment box as an alternative to Apple's. (The advantage is that the CE box doesn't get wiped out when you rebuild your desktop.) Choosing to view Get Info at the Technical level lets you modify a file's Type and Creator, set bundle bits, and perform other low-level hacking operations — not for the squeamish, but very helpful if you need it.

The impressive Find function searches files and folders by name, size, created date, modified date, type, creator, or any combination of these. Type and Creator options include a pop-up menu with an editable list of popular applications and files.

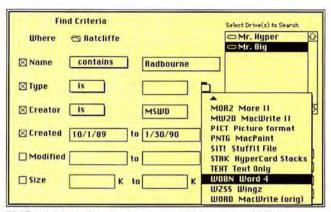
Searches can encompass all mounted volumes or an individual folder. Once the search is complete, you can "Retain" the list in your DiskTop Files Window, perform additional searches, and append the new files to the list of previously found files. When you're finished, you can perform a batch operation such as deleting,

copying, or moving. The list can also be printed as a nice directory or saved as a text file.

If that's not enough, DiskTop 4.0 comes bundled with Microlytics' GOfer 2.0, a DA that lets you search for text strings within a variety of documents (see Bobker's Dozen, November '89, page 296).

DiskTop's most radical change is in the way it handles file launching. DT Launch supplants

the old DiskTop menu listing and lets you open frequently used applications and documents—replacing utilities such as ICOM Simulations' On Cue and the Transfer feature of CE's own QuicKeys.



DiskTop 4.0 is the latest and most powerful iteration of CE Software's essential Finder replacement. Its extensive file-searching parameters include pop-up menus for Type and Creator, so you can easily create and choose from a list of application and file settings.

As with the rest of DiskTop, adding applications and documents to DTLaunch is very straightforward. DT Launch's Other dialog box lets you verify all resident applications and assign keyboard

# refine your characters.



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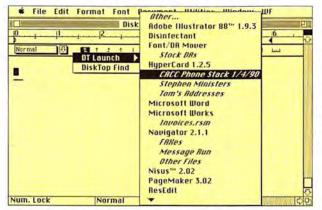
HP offers other LaserJets with Adobe PostScript software. The LaserJet IID printer with increased paper-handling capability. And the affordable LaserJet IIP printer. For character-building information and the name of your nearest authorized HP dealer, call 1-800-752-0900, Ext. 1168.

There is a better way.



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The new CEToolbox cdev lets you bring up a DT Launch/DiskTop Find pop-up menu anywhere on your Mac screen by pressing the Command, Shift, and Option keys (or your own configuration) and the mouse button.

commands for opening DiskTop, DiskTop Find, DT Launch, and GOfer. This eliminates erroneous "application not found" messages, a problem in previous versions of DiskTop.

From the CEToolbox cdev, you are

able to configure DT Launch and Disk-Top Find to be located directly under the About item in the Apple menu or alphabetically with your other DAs. You can also call up a DT Launch/Findpop-up menu by pressing the Command, Shift, and Option keys (or whatever combination you set) while pressing the mouse button. Between DT Launch and Disk-Top's Finder capabilities, you may

never see your Finder again.

All Disk Top commands have keyboard equivalents. A tear-out reference card incorporated into the slightly too-terse manual provides a handy summary.

In addition to GOfer 2.0, the DiskTop

4.0 package includes HeapFixer, an application to adjust System Heap size; the low-level virus-detection cdev Vaccine; and a demo version of QuicKeys.

THE BOTTOM LINE DiskTop 4.0 combines power, versatility, and ease of use into one tight package. And it's still a great value. If you consider that On Location costs a third again as much yet only does one of the things that DiskTop can do, CE's package becomes even more attractive. It's a must for every Mac owner who wants maximum productivity.

- Tom Petaccia

### **Get Info**

#### DiskTop 4.0 \$\$\$\$\$

**Published by:** CE Software, P.O. Box 65580, West Des Moines, IA 50265; (515) 224-1995.

Version: 4.0. List Price: \$99.95.

## With the HP ScanJet Plus, you've

# The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

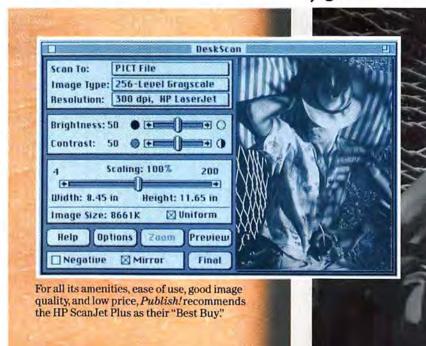
That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for \$2,190,\* about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call 1-800-752-0900, Ext. 1005 for your authorized HP dealer.

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# **BetaWatch**

Products on the Horizon

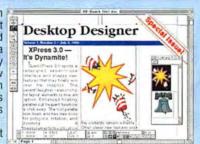
QuarkXPress 3.0 sports a redesigned, easier-to-use interface and snazzy new features that may finally win over the skeptics: The parent/daughter relationship for layout elements is now an option. Enhanced floating palettes put frequent functions a mouse click away. The tool palette floats and has new tools for polygons, rotation, and zooming. A measurements/modification palette contains editable information on the selected text or picture box (position, size, and rotation) and its contents (font, kerning, leading, scaling, rotation, and skewing). New library palettes are floating scrapbooks that can contain up to 2,000 objects each. Anything — text, graphics, grouped objects, even pages — can be dragged into or out of a library.

The new QuarkXPress also lets you assign and easily reassign up to 127 master pages. You can select, group, or rotate multiple objects; items within a group can still be independently moved or edited. Objects can be rotated in .001-degree increments, and their contents remain editable.

Other clever new features are paragraph rules, anchored picture

or text boxes that can be placed within text and move with it, and the ability to form a text block of any shape. You can now drag items between pages and documents and save pages as EPSF files.

The impressive list of improvements in-



cludes bleeds and multipage spreads; definable zoom levels; polygon picture boxes; a pasteboard; multiple-object alignment, spacing, and distribution; and independent horizontal and vertical measurement units. The program also supports font sizes of up to 720 points, editable widow/orphan control, vertical justification, user-definable drop caps, and better control over color trapping. To complete the overhaul, the documentation has been completely rewritten.

QuarkXPress 3.0, \$795. Upgrade, free if version 2.12 purchased after March 1, 1990; \$30 if currently under extended warranty; \$150 for registered users out of warranty. Quark, 300 S. Jackson, Suite 100, Denver, CO 80209; (303) 934-2211.
ETA: April 1990.

## got it made in the shades.





MONITORS

# Mitsubishi XC-3715C Color Display Monitor

A giant monitor makes the perfect presentations partner.

Presentations on a Mac have always been a problem. A small screen accommodates a squinting audience of at best three or four; LCD projection panels expand the image, at the expense of speed, contrast, and color. Video-projection systems solve those limitations, but they're hard to set up and move around. Mitsubishi, however, gets around all these problems with its XC-3715C Auto-Tracking Color Display

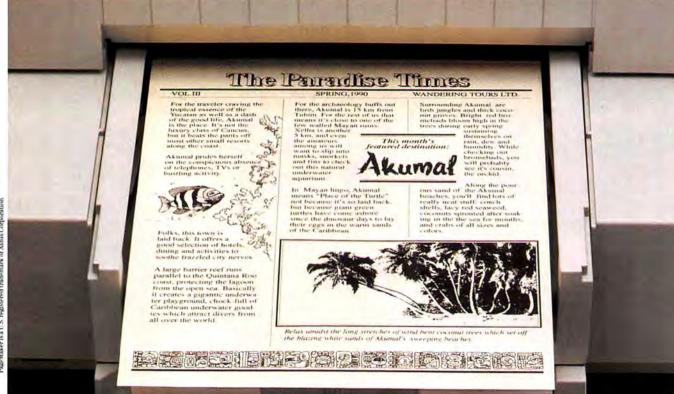
Monitor, featuring a 37-inch (diagonal) picture tube, stereo sound, and an easy-to-move pedestal base.

THE MODEL MONITOR The XC-3715C contains a 37-inch (diagonal) CRT with 35 inches showing through the front bezel. The 217-pound behemoth sits atop an optional pedestal that features two adjustable shelves; a storage drawer; a built-in power strip; and large, heavy-duty casters for easy movement (by two

people). An Apple High-Resolution Video Card or equivalent can drive the XC-3715C, as can any IBM-compatible CGA, EGA, or VGA video card. Inputs are also provided for NTSC composite and S-video. Stereo audio inputs for each video input are automatically switched in tandem, and a stereo amplifier provides good sound through the internal speakers, with switchable outputs for external speakers. A built-in microprocessor autosizes the screen image for each video format, making the transition between Mac II, PC, and NTSC video as easy as clicking one button on the front panel or supplied remote control.

TESTING ... TESTING Inside a 37-inch CRT, the laws of physics can sometimes win out over good engineering, and this showed up in a few areas in our tests. In the center of the screen, focus and MTF sharpness tested quite high, but on the far left and right sides of the display, fuzziness won out over detail. Power-supply regulation was not up to par with that of typical small monitors, causing the screen

# With the HP DeskWriter, you can



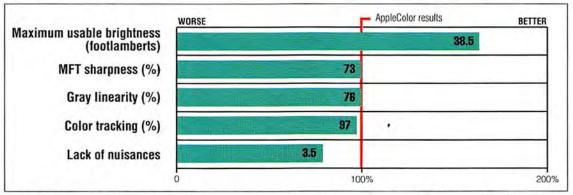
Suggested U.S. list price: © 1990 Hewlert-Purkant Company. PET2005 ocuments created using Microsoft. Ward and Aldus PageMaker! From the al. C. Sugdered Lindenank of Microsoft Companion and Companion of Aldus Companion.

## REVIEWS

#### Macuser How We Tested It

MacUser Labs evaluated the XC-3715C by using a Mac IIx and RasterOps' 24-bit ColorBoard 264, which has a resolution of 640 x 480 dpi. We evaluated viewing area, dpi, maximum usable brightness, gray linearity, color tracking, misconvergence, geometry, color quality, and nuisance factors (flicker, jitter, bandwidth, uniformity, and glare). Larry Pina's Test

Pattern Generator and our own Canvas 2.1 files provided the test images. A custom-manufactured CCD device and digitizing oscilloscope tested MTF sharpness. A Klein Convergence Meter and Minolta TV-Color Analyzer checked convergence and other aspects of monitor performance. For a detailed description of the testing process, see the Color Buyer's Guide, May '90, page 38.



The 37-inch Mitsubishi XC-3715C color monitor's performance was similar in most regards to that of the more familiar 13-inch AppleColor monitor, making it an excellent choice for Mac-based presentations. The results shown are normalized to the test results for the AppleColor monitor. The numerical values for the XC-3715C are also shown.

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# **Start** Up



The 37-inch Mitsubishi XC-3715C's 35-inch diagonal screen is more than eight and a half times larger than that of the standard AppleColor monitor (dark blue area).

image to expand when displaying large, bright objects. From six feet away, overall screen geometry appeared quite good, but as we moved closer, we noticed a slight waviness in the image and some pincushioning along the left and right sides.

Other than the problems caused by its size, the XC-3715C has few drawbacks. The color tracking and gray linearity are

first-rate compared with those of most small displays. The display is quite bright, displaying 38.5 footlamberts while maintaining good focus over most of the screen. The bright screen compensates for most of the glare of the polished screen surface. Mac II video displayed at 23 dpi, yielding a viewing area that's 8.6 times larger than a standard AppleColor monitor's 69 dpi.

Our test pattern of 121 color shades produced vibrant and saturated pure red, green, and blue, and all the intermediate shades appeared smooth and well defined. Misconvergence of the red, green, and blue beams was only slightly noticeable in the corners and did not significantly affect the appearance of the overall screen image. Regulation and glare problems affected the nuisance score for the worse, resulting in a score of 3.5 on our 5-point lack-of-nuisances scale (see the "How We Tested It" sidebar for an explanation).

THE BOTTOM LINE A 37-inch CRT pushes the limits of existing monitor technology,

revealing the laws of physics on-screen. Other than extreme fuzziness at the far reaches of its vast screen area, troubles with power-supply regulation, and glare, the unit has few problems, displaying excellent color and working well with both 8- and 24-bit Mac II video. The XC-3715C is a definite must-buy for both the conference room and lecture hall.

Jeff Pittelkau

### **Get Info**

#### Mitsubishi XC-3715C Color Display Monitor

Manufactured by: Mitsubishi Electronics America, 991 Knox St., Torrance, CA 90502; (213) 515-3993.

List Price: monitor, \$7,599; pedestal, \$995; Mac II video cable, \$54.

Pigments for your imagination.

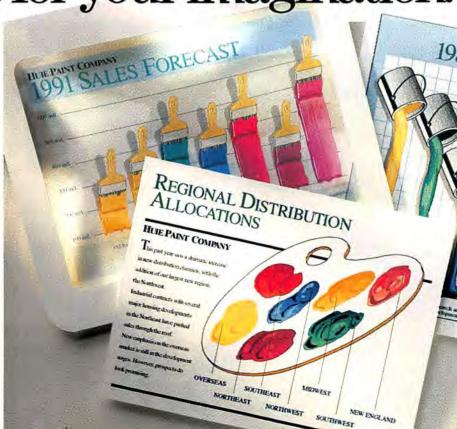
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# Rumor Manager

#### Gossip, Guesses, and Goings-On

The purchase of Silicon Beach Software by Aldus put an end not only to the bidding war between Aldus and Microsoft for Silicon Beach Software but also apparently to Microsoft's not-so-secret attempt to buy into the Mac graphics market.

It's been well known for a while that Microsoft, a company that likes to talk about its well-rounded Mac line, has been shopping for graphics and DTP programs. Its failure to acquire Silicon Beach has given plenty of ammunition to the powerful "let's-do-it-in-house" crowd, and they appear to have convinced His Billness that their way is the only way for Microsoft to go.

Several products have been under development for a while, and the effort has just been stepped up significantly. The first to hit the market will be a very interesting DTP utility package. I've seen it, and I'm impressed.

The second product is a 24-bit painting program. The current version (and specs) don't threaten PixelPaint Pro, but it's still early. This product is slated for release at either the San Francisco or the Boston Macworld Expo in 1991.

Work has also started on a high-end page-layout program, but

that's about two years off. Microsoft would still love to buy a highend page-layout program and is talking to at least one publisher.

The hottest new HyperCard goody for Christmas 1990 will be HyperFast (that's the current name). It's a two-part package that dramatically increases HyperCard performance. Part 1 is software only. It requires 3 megabytes of RAM and speeds most stacks up by 25 to 40 percent.

The second part is hardware. The HyperFast accelerator card plugs into a NuBus slot and has 4 megabytes of very fast RAM onboard, as well as a custom coprocessor. It can speed up stacks by ten times or more.

Apple has been working with the HyperFast developers, who are in the Midwest, so the product will be fully compatible with HyperCard 2.0.

Expect to see both parts of HyperFast on the shelves in late October. The software will be cheap, probably less than \$100. The hardware, on the other hand, will be pricey. The current price goal is \$999, but that depends on how cheaply the custom coprocessor can be made.

#### ----

Our U.S. Mail address is Rumor Manager, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 70411,204 (on CompuServe), and MacUser.Edit (on AppleLink). No calls, please.



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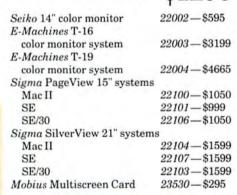
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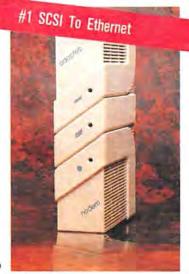
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latest round of the
data wars.



nyone who has chronicled the database debates will tell you that these differences of opinion have all the earmarks of religious wars: They're fought for seemingly arcane reasons, they generate a lot of corpses, and they go on forever.

The reasons for this fervor are really not quite as mysterious: Developing a working database requires blood, sweat, and not a few tears, and the result has a life-or-death quality: A database is of little use if those using it cannot rely on it absolutely.

It's passion in the service of dependable data, and to hear database developers argue about it, it has become the corporate equivalent of the Crusades.

MacUser has entered the fray with a simple strategy: We took the two most similar leading contenders in the multiuser relational arena — 4th Dimension and Omnis 5 — and examined them side by side. We wanted to know how they stood up as development tools, and because we wanted expert testimony, we chose product developers to write the stories.

Two data duelists of a different sort, Double Helix 3.0 and FoxBASE+/Mac, are also part of the battle. We allow them to display their colors and have included them in a series of speed tests. These benchmarks tested a simple database in multiuser mode that we set up with the help of The Automation Group. The results are surprising, even controversial.

MacUser Labs plans to continue testing database programs, under different configurations, and we'll publish the results of round 2 of the data wars in a database update.

# igh-end databases, such as 4th Dimension (4D) by ACIUS and Blyth Software's Omnis 5, are part drawing program, part file manager, part interface builder, and part programming lan-

guage. 4D and Omnis 5 do similar things, but they do them very differently.

4D was designed to support the Macintosh interface with Macintosh fonts, graphical-layout editing tools, and buttons. It was conceived as a user's tool — whether the user is an average user who does simple data entry, a power user who designs on the fly, or a developer who wants to create stand-alone applications for the run-time environment. 4D's tools greatly smooth the skill transition from novice to expert. In contrast, Omnis 5 is strictly a developer's tool

# 4th Dimension

#### By Louis E. Benjamin, Jr.

for producing custom applications.

A large difference between the two programs has to do with vocabulary — dissimilar terms are used to describe the same thing, and the same word used in both programs can mean something very different. For instance, in 4D, a window is an aperture for displaying layouts; in Omnis 5, it describes what 4D calls layouts. Lists in Omnis 5 are similar to 4D's one-dimensional arrays; in 4D, lists are special resources stored in the structure file.

If you have complex database

needs, Omnis 5 is a good choice. You

can use it to create applications that

would have required minicomputers

or mainframes a few years ago. As a

result, development and hardware

Because both Omnis 5 and 4D support external procedures, it's important to emphasize what each can do in its *native* state, without enhancements. For example, 4D provides pop-up menus as a standard control object. If you want to use a pop-up menu in an Omnis 3 application, you have to use an external

#### **Layout Editor**

Designing layouts (windows in Omnis 5) is one area in which 4D and Omnis 5 are very similar, as both

ou have to look beneath the surface of multiple-file, multiuser database applications to see their real qualities. Speed, flexibility, and data efficiency are the most impor-

tant elements, and their absence can't be masked by even the cutest interface.

costs are significantly lower, and applications are much more flexible and easier for operators to learn and use. And Omnis 5 is almost identical on both the Mac and PC platform.

Businesses and corporate departments that track numerous transactions are

rate departments that track numerous transactions are the type of environments that rely on Omnis applications. In contrast, 4D is primarily a consumer product. It works well in single-user applications, but it lacks the power and flexibility to maintain adequate speed in high-volume, multiuser situations.

Omnis 5 is an update of Omnis 3. which was the first viable multiuser database platform for the Mac. Omnis 5, introduced last year, has even more data-management strength and flexibility, as well as more interface features and programmers' aids. It ships with a set of externals that allow HyperCard to become a powerful multiuser, multiple-file database.

Omnis 5 now has interface features comparable to those of other databases, and it's an easier, faster development environment for experienced programmers than both Omnis 3 and other databases.

#### The Hybrid Database Model

Omnis is a hybrid of the three multiple-file database models, which are relational, hierarchical, and network. The relational database deals with multiple related information files. All files are independent, and

sport a MacDraw-like interface. However, 4D allows you to choose one of eight default layout templates. The only option in Omnis 5 is a blank sheet.

4D has more native control objects than Omnis 5, which doesn't have the former's Radio Picture buttons, popup menus, nonflashing invisible buttons, graph areas, thermometers, rulers, or dials. Omnis 5 windows have nothing similar to 4D's "included" areas, which simplify multifile and subfile data entry and navigation.

4D's standard button actions allow you to navigate between records and layout pages, manage included areas, and accept or cancel the current record. Buttons with these default actions require no code to function properly.

nother 4D feature that isn't available in Omnis 5 is the class of layout elements known as external objects. which allow external procedures to

run whenever the cursor is over a particular area in a layout.

Many 4D external objects actually redraw in the layout editor to show what they will look like when your application is running. 4D's external objects can contain scripts, so that the entire area becomes selfconfiguring and self-contained. If you forget to install the external procedure that supports an area, 4D will notify you while you're in the layout editor.

If you need to control the tab order of fields in your layouts, 4D's entryorder mechanism is far simpler to manage than the Omnis 5 field-numbering mechanism. In Omnis 5, fields must be carefully aligned to a grid. With 4D, you select Entry Order from the Layout menu and use the cursor to trace out the tab order.

In addition, Omnis 5 windows do

not have scroll bars, although Omnis 3 provided this feature as an option, which causes problems for users who try to upgrade to Omnis 5 applications. 4D allows you to choose whether or not to have layout scroll

Although Omnis 5 claims support for Macintosh fonts, you have to

relationships are established by records from files that share a common field value. Relational databases, such as 4D, are easy to use, but they deal with multiple files one at a time.

The hierarchical database orders nformation in a rigid structure of categories, subcategories, and subsubcategories. A record at the lowest level includes the information of all levels of linked records above it.

In the network database, file links are flexible and are of the many-tomany relationship type, which tends to be more typical of a real-world work situation.

Omnis 5 is the first multiple-file database language to combine the flexible relational model, the highly organized hierarchical methodology, and the network-database theory's ease of dealing with many-to-many

relationships.

#### The Omnis Connection

An Omnis programmer can establish relationships among files by creating common fields to link records, but a better way is to use the Omnis Connection facility, which allows each file to be connected to as many as 12 files.

The connected records act as extensions of each other. If you connect a file representing invoice information to a file for customer information, you can automatically locate the customer record for that invoice by locating a record in the invoice file (using the Find, Next, or Previous commands). This can save countless programming steps as compared with strictly relational methods.

#### Indexes

All multiple-file database products can create and maintain indexes. These are used to quickly locate records with specific field values and to browse through a file in a specified order other than the one in which records were entered.

Connected file records, including their indexes, act as extensions of the main file record so an invoice record can be located by use of a customer's

# Umnis 3

**By David Swain** 

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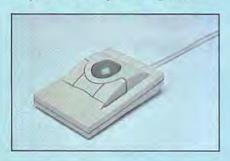
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#### The Data Duelists



install the fonts into each application. Omnis 5 applications can have only 16 fonts per applica-

tion, and two different font resources are maintained—one for reports and one for windows. 4D simply reads the available fonts from the current system.

#### **Menu Editor**

4D allows 32,000 menu bars containing as many menus as will fit on your screen. Omnis 5 allows you to create menus, but it doesn't provide a menu-bar mechanism, and it stops displaying menu items at the 20th item. You can make Omnis 5 menus shorter but not longer.

In Omnis 5, a developer can end up with identically titled menus installed at the same time. In contrast, you can set up 4D applications with a single menu bar — enabling and disabling items as needed — and you can preview any menu bar from the design environment as well as attach a picture to the splash screen.

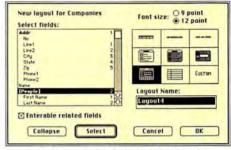


Figure 1: 4D can create eight standard layouts, using a complete point-and-click mechanism. You can create your own layout with the Custom ontion.

#### Structure Editor

4D's structure editor allows you to track very complicated file structures with an updated graphic map. Many Omnis 5 developers keep such structure maps of their own; because Omnis 5 doesn't provide this feature for them, they have to create it with something like MacDraw and update it with each change. In 4D, the structure editor is an intrinsic part of the design process, so you can view the

last name, zip code, or any other field indexed in the customer file. A single command can build a list of invoices for a customer ID, state, zip code, or any other indexed information in any connected

file

#### **Multifile Updating**

Because Omnis 5 sees the current records from all files as one huge record, updating information is simple. For instance, Omnis can simultaneously update customer records, a daily sales-tally record, and a system-information record every time a new invoice record is created. 4D has to update each record separately — even in single-user mode.

#### The Learning Curve

Programmers need to study a lot before they are proficient in either Omnis 5 or 4D, and Omnis 5 makes no pretense about this. 4D, however, offers some shortcuts that can draw in and trap novice programmers, in

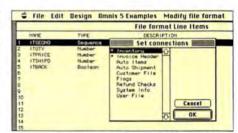


Figure 1: Files in Omnis 5 are related by simple selection of the file or files to which the current file is to be connected, subject to modification.

essence making the total learning curve much longer. For instance, 4D's graphical file-structure editor invites novice programmers to experiment rather than to plan out the work ahead of time. For a while, it seems that work is being easily generated, but if you discover later that some fields or files you've created are not required, 4D doesn't allow you to delete them. This kind of programming almost always leads to wasted time.

4D's graphical procedure editor is

#### **Double Helix**

Double Helix 3.0 is one of the fastest multiuser Macintosh database programs around (see MacUser Labs tests). It has the most Mac-like interface, making it easy to learn and use, and its multifile databases aren't built in code; they're built with a variety of icons symbolizing different "relations," or files. Relations are composed of fields, templates, abaci (calculations), and other elements.

Unlike Omnis 5 and Fox-BASE+/Mac, Double Helix doesn't limit how many files you can open; how many icons, labels, or fields may be added to a file; or how many characters may be added to a field. By using

subforms and look-up abaci, developers can draw information from all files.

Because Double Helix combines data and structure, objects can be modified in the database without special provisions. Thus, structural development and refinements are point-and-click operations.

Whereas other databases offer only one way to view a collection's structure, Double Helix offers three. The View by Icon mode groups icons on-screen, and the View by Kind and View by Name modes allow you to add a description of an icon's function.

Double Helix's templates, which can be of any size, have multiple layers: You can scan or draw a company's forms and then import them into a template's background. Version 3.0 also has button fields, which allow developers to use text or pictures to make various functions automatic, and the program's new sequencing capability is similar to QuicKeys'. Both files and collections can be exported into your word processor for hard-copy evaluation.

Double Helix allows developers to produce an unlimited number of four different types of menus: Administrator, Regular, Submenu, and Prototype. Prototype menus can be duplicated for distribution as needed — to new staff members, for instance — with new or changed passwords. These functions are far more difficult in the other databases reviewed, either because their initial programming is more complicated or because their systems are more difficult for users to master.

Double Helix has some limitations. It cannot directly address the serial port, so it can't be used with a nonstandard printer that lacks a printer driver or be used to bypass the printer driver in a standard printer. Developers should be able to overcome this limitation with the Communications Toolbox, which is expected to be part of Apple's System 7 release.



Figure A: A composite of the three ways to view a collection. From top to bottom: View by Icon, View by Kind, and View by Name. The icon palette used to build each collection is on the left.

Double Helix is the most user-friendly database currently available. It's ideal for those who lack a programming background: The icon system enables anyone who can master basic algebra to program a sequence such as "If X = this and isn't > Y then do Z."

Double Helix has one last advantage: It's the *only* program that can be ported to any DEC VAX running VMS. This offers great speed potential and allows for more users simultaneously running multiple Helix databases on-line.

- Richard E. Meyeroff

#### **Double Helix 3.0**

Double Helix lets users build relations in multifile databases with icons rather than code. Its flexible file structure allows an unlimited number of icons, labels, or fields to be added to a file.

Pros: Double Helix is fast, particularly in multiuser mode, and easy to use. Its icon orientation makes development and programming simple. Its connectivity to VAX systems running VMS allows developers to work on Macs rather than on costlier VAXes.

Cons: Double Helix cannot directly address the serial port. When posting information from one file to another, users cannot control the order in which the posts go in. Some users may not like being confronted with Double Helix's forest of icons.

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# Which Database?

4th DIMENSION now offers the easiest-to-implement relational capabilities; its overall functionality and programming capabilities may make it the first real Macintosh database standard. INFOWORLD, September 1989





4th DIMENSION outshines all the other databases with its number of features and rich database development environment (...) Of the current programs. 4th DIMENSION is the most complete and powerful. BYTE, January 1990

Given that 4D was the first program to allow database designers to build a Macintosh interface, Acius has the advantage of experience over its competition. MacWEEK, June 1989





ACIUS has created a rich environment for database users at all levels. MACWORLD, January 1990

4th DIMENSION 2.0 is a rare treat (...) You really can create powerful multifile database systems without getting involved in coding at all. MACUSER, February 1990





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#### The Data Duelists

fields in each file and the relations between files at any time. The structure editor also provides an easy path to the Layout edi-

vides an easy path to the Layout editor and the field-definition dialog boxes.

Omnis 5 allows only 60 file formats, including memory-only files. 4D, however, allows 99 files and unlimited variable definitions. A 4D file can contain 511 fields, whereas Omnis 5 allows only 255. Omnis 5 also can't create subfiles or multivalue fields, whereas a 4D subfile can tie a very large number of data values to a single record.

4D doesn't limit how many fields you can index in a file, unlike Omnis 5, which limits you to 12 indexes per file and file format.

In 4D, "relations" compare the values of the connecting fields in each file to determine whether the records are related. Whenever you change the values of the connecting field in either file, 4D automatically reselects the appropriate related

records. To create relations in 4D, you click on a field and then drag to the related field in the other file.

#### **Procedure Editor**

4D draws upon the Pascal programming language as the model for its procedural language (Pascal is a widely used programming language that is clear enough to be understood by novices).

4D's procedure editor feels like a word processor with lots of built-in shortcuts. In Omnis 5. you construct procedures by choosing from lists, but you must always use that interface. 4D allows users to mix writing styles, to type directly where applicable, to use pointand-click selection, and to paste in code

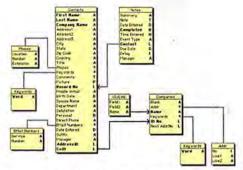


Figure 2: 4D's structure editor provides an overview of files and relations. Field names shown in bold are indexed. Subfiles, marked with an asterisk, appear as fields in the parent file. They are connected to the parent with a gray line.

#### **Host Connectivity**

The database programs we've covered work on an all-Mac network. But if you need more power than Macs can provide or if your company already has bigger computers, you may want to run your database on a mainframe host.

Apple's marketing push into host connectivity has resulted in exciting products that provide the best of both worlds: the data-processing power of a large minicomputer or mainframe accessed from your desktop through a friendly Mac interface.

Host connectivity is certain to be a hot topic in the early 1990s as Macs are more closely integrated into the corporate MIS world and as Mac users demand more database power. We'll be covering these topics in detail in future issues, but for now, here's a quick summary of some of the options available today:

 CL/1, Apple's new connectivity language, is quickly becoming a standard interface between Macs and host databases. New applications such as Clear Access and GQL — or extensions to HyperCard, Wingz, and other similar programs — give a completely transparent Mac front end to an SQL database. The line between the two worlds is also blurred by the fact that 4th Dimension, Omnis, and Double Helix can — or will soon be able to — access data with CL/1.

 SequeLink, the granddaddy of host-connectivity languages, has allowed access to host data from a Mac front end for many years. It can be used from HyperCard and 4th Dimension, among others, and can access Ingres, SyBase, and other leading SQL databases.

 Oracle offers external routines for 4th Dimension, HyperCard, and other programs that allow access to Oracle databases on a wide range of host computers.

Each of these products transforms the host into a data server for your Mac, returning the information that your Mac requests. Other solutions, including MitemView and MacWorkstation, allow you to put a Mac front end onto your existing host databases without substantial rewriting.

Note that every one of these products is merely a pathway between a programmable application on the Mac, such as HyperCard or a database program, and a host database. But these products can't handle all possible situations. You can get a wider range of choices with a DEC VAX and one of the leading SQL-compatible databases.

- David Beaver

another trap. It allows you to design a flowchart of a procedure, but once you've begun designing a procedure this way, you

designing a procedure this way, you must continue, because the graphical procedure editor doesn't create editable code. If it did, it would be a hot feature.

#### **Procedure Editing**

To access commands in 4D, you type the first few letters and then a wildcard character, which brings up the first keyword in the commands list that begins with those letters. Omnis 5's more responsive method of keyboard access to commands, field names, and functions means that you're not typing blind: As you type in each letter of a command keyword, the selected line in the list changes to the first line that matches the character-string typed so far.

You can also use a wildcard that can be embedded in the typed string and that acts as an "any string" substitute. For example, to select the Open window command, the programmer types o\*w. Omnis 5 reads this as "the first command beginning with an o that also contains a w." Most commands can be selected by four or fewer keystrokes.

#### Event Management

Omnis 5 has the most complete set of event-management



Figure 2: Procedure commands are located by use of list-navigation techniques.

Details are then filled in, and the same procedure can often be used on other lists. Experienced Omnis 5 programmers require far fewer keystrokes than experienced 4D programmers using comparable 4D shortcuts.

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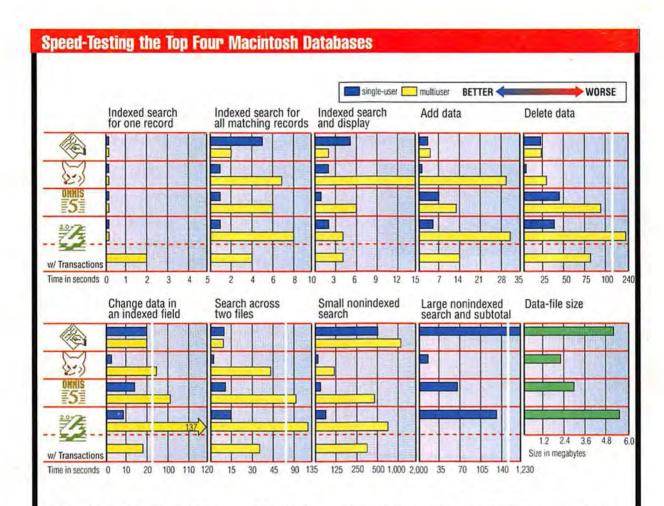
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#### The Data Duelists



Speed is the big issue in the database wars. Different features, however, make it difficult to come up with tests in which all the products compete on a level playing field. The test results may or may not be applicable to your situation, but you shouldn't choose a database program on speed alone.

#### The Tests

The tests were done with a small sample application designed for a medical office. The database included two files, one of 5,000 patients and one of 15,000 charges and payments. Each patient had coded charges and/or payments containing the account number. Both files had about ten fields, some of which were indexed.

We used two Mac SE/30 computers, each with 2 megabytes of RAM and an 80-megabyte hard-disk drive. One machine was a workstation, the other a file server connected with Phone Net. The file server used AppleShare software; Double Helix used its own server software. A different network or hardware mix may produce different results.

The databases were given the following commands:

Indexed Search for One Record

Search for the first patient whose last name is Smith.

Indexed Search for All Matching Records

Search for all patients with the last name Smith, and do something with each one that will cause the records to be loaded from disk.

#### Indexed Search and Display

Search for all Smiths, and display them in a list on the screen. Add Data

Automatically create ten new charge records for one patient, and

add them to the charge file; then find that patient, update his or her current balance, and save the patient's record.

#### **Delete Data**

Delete ten patients and all of their charges.

#### Change Data in an Indexed Field

Find all 100 charges with the code of N, and change each occurrence of that code to Y.

#### Search across Two Files

Find all the patients who have had a charge with a certain code. (Essentially, find all the charges with that code, and then find all the patients whose accounts match those charges.)

#### Small Nonindexed Search

Search for all patients whose last visit occurred after a given

#### Large Nonindexed Search and Subtotal

Search for all charges after a certain date, and calculate the total amount of those charges.

#### **Data-File Size**

The size of the data files on the disk was recorded.

- David Beaver

David Beaver is the president of The Automation Group, a San Francisco, California, Macintosh-database-consulting firm.

Thanks to the following consultants: Lenny Eiger, Data Bright Management Systems, Mill Valley, California (Double Helix); Kevin Monahan, Silverwinds, Santa Cruz, California (FoxBASE+/Mac); David Beaver, The Automation Group, San Francisco, California (4th Dimension); and Leon Venter (Omnis 5).

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#### The Data Duelists

from a text file.

4D has other time-saving attributes: For instance, typed-in fields automatically appear in capital letters, procedure names appear in italics, and external procedures appear in bold italics. Conditional and looping structures automatically indent and appear in boldface to make the code more readable. When you print a 4D procedure, lines are drawn to show where conditional and loop structures tie off, simplifying the debugging process. Omnis 5 provides only auto-indentation.

When you're defining procedures, Omnis 5 makes you select from a list. This helps you avoid typos but can take a lot longer than 4D's method of typing a few characters of the procedure and a wildcard character. 4D defines procedures with a point-and-click interface and pop-up menus.

4D has glossary tools much like the ones included with the Data Desk keyboard. These tools can be set up to use a simple shorthand to type standard procedure structures. My machine types the following whenever I enter \fori":

For (\$i;1;Records in
 selection())
NEXT RECORD()
End for

Omnis 5 function names — such as #EN and #L — can sometimes seem like secret passwords, so you're likely to keep a crib sheet with you for some time. In contrast, 4D function names are brief phrases, such as Error and Modify Selection.

#### Debugger

Omnis 5 provides no direct aids for tracking down logic errors, making it a time-consuming process even if you have good tools. 4D's debugger helps fix undefined variables, fields with the wrong values, and improper record selection. You can also check field values and variables.

#### **Report Generation**

4D has three ways of generating



Figure 3: 4D's Radio Picture buttons can be superimposed on a graphic. Thermometers, Rulers, and Dials can show values or provide analog input from the user.



Figure 4: You assign a name to the object tool in the layout editor's tool palette by selecting Button from the Type pop-up menu. Standard actions, such as Accept and Cancel, can be assigned in this way.



tools of any Mac database-programming language.

Where field scripts in 4D can deal only with Before, During, and After events, Omnis also reacts specifically to Tab, Shift-Tab, Click, Double-Click, and Window-Click events, which means it can treat any field object as a button that can trigger a procedure.

There are also Set Next Action commands, which give programmers control over the outcome of events and the application's conditional flow. For instance, when tabbing forward from a gender field in a medical record, you'll see data-entry windows for either a male or female patient, depending on what you specified in the initial input.

Omnis 5 also includes optional window-and application-control procedures that control non-field-specific events and manage complex sets of possibilities, such as monitoring the operator's use of multiple open windows.

#### Menus

Omnis 5 has independently installable and removable menus. You have to define the menu only once, and its custom File and Edit menus simply replace the standard ones in their proper positions. In 4D, however, you have to define a new menu bar, even if you want to add or remove only a single menu.

Because operators need fast access to their commands and often prefer to type keyboard command equivalents rather than use the mouse, a long scrolling menu such as those 4D often uses wastes time — and you run out of easily remembered keyboard equivalents when you have more than 30 menu items available. Omnis 5 limits accessible items to 20 per menu, more than enough in most situations.

#### Reports

Relational reporting is one of Omnis 5's strong suits. In contrast, 4D still requires many procedures to accomplish what Omnis 5's report



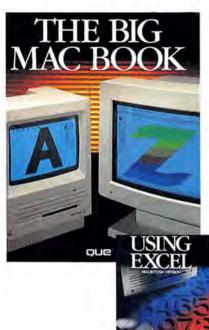
Figure 3: Independent windows showing lists of invoices, subscriptions, and unpaid receivables for a selected customer are common in finished Omnis 5 applications. They can make the end user's job easier and more effective.

generator does routinely.

For example, Omnis 5 includes default sort and subtotal specifications directly in the report definition. These can be overridden by procedure commands, but the report can stand on its own.

4D requires that procedure commands define sorts and subtotal breaks. This method isn't much more trouble than Omnis 5's method for a simple report, but when a complex

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#### The Data Duelists



reports and two for creating labels. Omnis 5, on the other hand, has only one report edi-

tor. In the simplest case, a 4D user can select Print or tie a Print Selection command to a menu in the runtime environment and 4D will print the selected records. You can use the label generator to print labels with or without a 4D layout.

You can use 4D's Quick Report editor to save ad-hoc reports: drag fields into a report area; add sorts and calculations; change fonts; specify breaks; and request subtotals, counts, or other statistical functions.

The Print Layout command can be used in a procedure with multiple layouts to create reports that redefine themselves as the data being printed changes.

#### **Documentation**

4D's documentation comes in the form of compact, spiral-bound booklets that lie flat, unlike Omnis' cumbersome D-ring binders.

definition is needed, Omnis 5 is much easier to use.

For particularly complex and demanding reports, Omnis 5 can create procedures for controlling the record location and reporting process, use lists as temporary sort buffers, and override sort fields and parameter setups. The more complex the application and the report are, the more speed advantages Omnis 5 has over its competition.

There are two areas in which Omnis 5 could be improved. First, it can't save the page and job setup for a report without using an external. Second, 4D has a good report-charting feature — and though Omnis 5 can launch Excel, Wingz, or Cricket Graph, it would be nice to have charting capabilities too.

#### Intelligent Multicriterion Searches

Omnis 5 has built-in optimization features that utilize search formats, sort-field specifications, and indexes

#### FoxBASE+/Mac

FoxBASE+/Mac runs programs written on DOS machines using the dBASE language, giving programmers full control of the Mac interface. It integrates dBASE with a

Fox Software, Inc.

FOXBASE+/M

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nonprocedural graphical interface that allows anyone to perform complex operations without writing source code.

Since FoxBASE+/
Mac's first release, it has added a MacDraw-like screen painter for designing input screens, a powerful report generator, support for Hyper-Card XCMDs and XFCNs, and a template generator to help write code.

FoxBASE+/Mac offers a View window that shows relations among open files: a Setup dialog box that lets you examine or change the database's structure; and a Command window that lets programmers re-execute commands for pasting into a program. Nine output screens are available, and trace and debugging windows allow programmers to

monitor their work. FoxBASE+/Mac supports color and large-screen monitors. You can use commands or the screen painter to create HyperCard-like applications.

Screen-refresh speed is slow, and performance is weak in multiuser operations. This problem may make a FoxBASE+/Mac application look slow, but the data handling is extremely fast. FoxBASE+/Mac speeds through singleuser performance tests by using RAMcaching techniques that aren't available when a file server houses the data. As a

> result, its performance is degraded on a network.

> FoxBASE+/Mac consistently beat Omnis 5 and 4D on a single machine, but our tests found a large performance decline in a multi-user environment. In one example, it took 2 seconds to change a code on 100 charges in single-user mode but 95 seconds in multiuser mode.

These tests, however, involved a slow LAN topology, which Double Helix's data-server technology side-steps. Over Ethernet, FoxBASE+/Mac would have performed better, probably beating Omnis 5 and 4D.

Fox Software's FoxPro/LAN (not available at press time) should greatly increase LAN speeds on updated FoxBASE+/Mac



Figure A: FoxBASE+/Mac's windows'

nonprocedural interface provides an easy

way to learn dBASE. To set up a relation

between two indexed databases, drag the

arrow from one circle (an open data file)

Figure B: FoxBASE+/Mac's Report Generator offers variable column widths, dimensions, and record layout.

( a )

multiuser applications.

FoxBASE+/Mac strengths lie in its processing speed, use of the Mac interface, and ability to port dBASE code from DOS and run multiuser applications in a PC/Mac environment. Programmers looking for a relational database for writing true Mac applications should look at FoxBASE+/Mac.

-Christopher Dwyer

#### FoxBASE+/Mac 2.0 \$\$\$\$

FoxBASE+/Mac lets users perform sophisticated procedures without having to know how to write dBASE source code. For programmers, it includes features that help in writing applications.

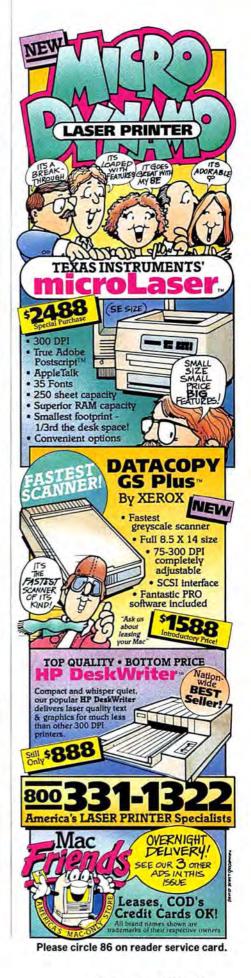
Pros: FoxBASE+/Mac runs DOS programs written in dBASE; it is fast in single-user operations. dBASE extensions give programmers full control of the Macintosh interface.

Cons: Speed declines in a multiuser environment, particularly over AppleShare. It requires dBASE program code; does not provide smooth field-level checking; needs serial-port communications, a more versatile report generator, and built-in CL/1 or SQL capabilities.

Requires: Mac Plus or later with 1 megabyte of memory, System 4.2, and Finder 6.0 or later.

List Price: \$495; multiuser version, \$695. Fox Software 134 W. South Boundary

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And unlike other programs, Speed Disk won't lose your data even if your Mac loses power.

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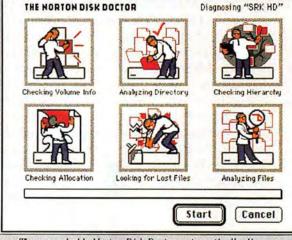
have to lose your data to want to get at it as quickly as possible.

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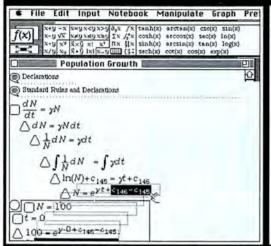
If you haven't got a favorite software dealer, call us right away at 1-800-365-1010 Ext. 423.

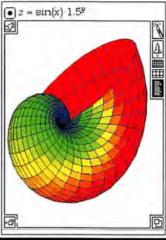
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#### The Data Duelists

Once you're familiar with an application's commands, you're likely to use the manual to verify syntax. An alphabetical listing at the back of the 4D command reference shows syntax and page ref-

erences. This greatly reduces the amount of page flipping you need to

The 4D manuals are also organized according to functional groupings. For example, all the commands related to arrays are close together. This is particularly useful when you're in the early stages of learning to write 4D code.

I tried to look up Functions in the Omnis 5 documentation and found a listing in the Application Designer's Handbook. The entry pointed out that the descriptions of the built-in Omnis 5 functions are in the programmer's reference, but it gave no page. I tried to look up how to install external procedures in Omnis 5, but I couldn't find this either. When I looked up External Areas in the 4D

to limit the records considered for a report. 4D can perform an indexed search only on a single criterion or by linking the search through Boolean operators.

For example, if you wanted to locate all unpaid receivables of more than \$500 from California, Oregon, and Washington, 4D would have to consider every receivable record in the entire file. Omnis 5 has to consider only the unpaid ones to locate this specific subset.

#### **Reusing the Building Blocks**

Omnis 5 procedures and objects can be cut and pasted in the Scrapbook or between windows, menus, or report formats within or between applications. Fields retain the procedures attached to them. Omnis 5 can also move any major application aspect (for instance, file or window formats) directly into another application. Professional database designers are able to develop modules that can be moved from application to



Figure 5: 4D's listing-style procedure editor works like a word processor and uses type-style formatting to show an element's function and procedure. The center area shows all the fields and layouts for a file and has a hidden pop-up menu that allows you to select files easily.

Glossary and Master Index, I found what an external area is, how external procedures are installed into a 4D application, and references to more-detailed information.

#### Rebuttal

Mapping databases. Even experienced developers must

application in a matter of seconds, merging features from different programs into a new, customized solution quickly and efficiently. To do this in 4D, you have to pay up to \$200 to get ACIUS's new 4th Dimension Moyer.

#### **Transaction Processing**

The 4D Transactions feature temporarily returns an application to single-user mode, locking all files until the transaction is accepted or canceled. Only one transaction can be active at a time. This kind of "application locking" is fine in a simple multiuser system in which only one person does data entry while a few others have access for browsing and reporting. But 4D transactions bog down the work flow when many people are using the database for different activities.

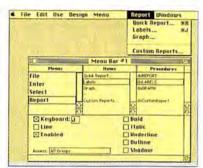


Figure 6: 4D's menu editor lets you control the menu style, keyboard shortcuts, and enabled/disabled state. The procedures listed in the right column will be run when the menu item is selected. The entire menu bar can be previewed from the editor.

#### Further Reading

Many vertical applications have been developed in 4th Dimension, Omnis, and Double Helix, and the SBT Accounting series is a FoxBASE+/Mac application. For a current listing of these applications, take a look at the following publications:

4th Dimension Solutions ACIUS, Inc. 10351 Bubb Road Cupertino, CA 95014 (408) 252-4444 List Price: \$10

OMNISource
Blyth Software, Inc.
1065 E. Hillsdale
Blvd., Suite 300
Foster City, CA 94404
(800) 843-8615
(800) 223-8050 (in
CA)
List Price: Free, on-

disk

Solutions: The
Directory of Developer
Applications and
Services, Third Edition
Odesta Corp.
4084 Commercial Ave.
Northbrook, IL 60062
(708) 498-5615
List Price: No price
was available at press
time.



Figure 4: By typing \*6, \*vu, or some other simple combination, the operator is able to access the list INO6 Vuylstekeara hybrid. This time-saving feature is available only in Omnis and greatly assists the end user.

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(Mac SE)

M3-MAC

(Mac II)

(IBM XT/AT & PS/2 Model 30)

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#### The Data Duelists



prototype, experiment, and revise when creating a complex system. 4D's development environment allows you to use 4D itself as the prototyping tool, and it helps you visualize the process.

A graphical structure editor also makes a permanent record of the file structures. Developers shouldn't be expected to keep the database in their heads — the application should be largely self-documenting.

Relational versus Hierarchical. The relational and hierarchical models of database design have been debated for years and will continue to be. Neither model completely solves every situation. That's one reason why 4D provides subfiles as another design option.

Event Management. Before, During, and After phases support a broad range of data-entry management. The Before and After phases initialize the record prior to display and updating related records or adjusting the modified record itself after it

#### 4th Dimension 2.0

4D offers simple ad-hoc development to advanced application design. Its user environment makes it possible to create a single-user relational database with no program code at all. Its editors support a broad range of work styles.

Pros: Easy customization of database. Strong graphic interface for developers and users. Interactive debugger that eases complex program-code development. Strong, easy-to-use, and well-organized documentation.

Cons: Limited multiple window support

 only the topmost window is active. Record-sequence field not always reliable in multiuser mode.

Requires: 6.03 or later; Mac Plus or later; 1 megabyte of RAM, 2 megabytes recommended.

List Price: Developing package, \$795; run-time packages: 1-user package, \$125; 2-user package, \$225; 4-user package, \$395. ACIUS, Inc. 10351 Bubb Road Cupertino, CA 95014 (408) 252-4444

has been accepted by the user. A During phase occurs every time the user edits a field and exits or clicks on an object in the layout. Commands such as Set Enterable and Go To Field give you control over layout navigation and data entry.

Report Generation. David Swain's discussion of report generation misses



#### The Bottom Line

One reason for the never-ending database wars is that no database program is suitable for every purpose. As this article shows, our recommendations are qualified: 4th Dimension wins as the most sophisticated all-around development environment for users writing their own databases, although its transaction technique is flawed as a multiuser strategy. Omnis 5 is the environment of choice for professional database developers because of its robust database engine and its transparency with Omnis on the PC. FoxBASE+/Mac remains the most viable database manager for those who need easy translation from the dBASE environment; in our tests, it was the fastest database in single-user mode. And Double Helix 3.0 is the most user-friendly database program to work in, with the best speed for key operations in multiuser mode for applications of the size and complexity of MacUser's test case.



An Omnis 5 application can update records in multiple files in a single write, with safe record locking. Only the actual records required by each user are locked for that user - and only momentarily.

#### **User Experience**

A 4D application and Omnis 5 application might look and, superficially, work identically - but the Omnis application would be noticeably faster, especially during a complex data-entry procedure with other users on-line. This speed advantage is also apparent during data retrieval and reporting. With the 4D application, operators waste a lot of time waiting to put in the next transaction.

Omnis 5 allows up to 30 windows to be open simultaneously - 4D allows only 1. A customer-service operator using an Omnis 5 application can open a list of invoices, payments, returns and refunds, telephone contacts, and notes on top of the customer-information window and arrange them for easy viewing.

#### Rebuttal

New Features. After this review was completed, Omnis 5 added even more native interface features pop-up and hierarchical menus, for example.

Fonts. The font list in Omnis 5 is

#### Omnis 5 ttttt

From the experienced programmer's point of view. Omnis 5 is fast and easy to program, and the finished product is very efficient.

Omnis 5's performance is far superior to that of other database managers when multiple users are simultaneously entering data.

Pros: Omnis 5 has a powerful databaseprogramming language that does better the more you give it to do. It comes with HyperCard externals for creating HyperCard front ends. Easy to program for multiuser situations.

Excellent report and search facilities. Good technical support and on-screen help.

Cons: Lacks a trace debugger. Poor documentation.

Requires: Mac Plus or later with 1 megabyte or hard disk with at least 1 megabyte free to hold program and related files, System 6.0 or later.

List Price: \$795; \$99 per additional user. Blyth Software, Inc. 1065 E. Hillsdale Blvd., Suite 300 Foster City, CA 94404 (800) 843-8615; (800) 223-8050 (CA)



## GOOD

The Macintosh® SE and Macintosh Plus from Apple® do just about anything that a *good* business computer can do. Both are capable of running thousands of *powerful* software applications, including some applications that no other personal computer can handle.

But what's really unique about the Macintosh SE and Plus is the world's most friendly user interface. End of story.

So Macintosh owners have the ability to do more things quickly and easily — which translates into greater productivity at work — or anywhere else for that matter.

## BETTER

Now all Macintosh SE and Macintosh Plus owners have the opportunity to take a fundamentally *good* idea — and make it even *better*.

Introducing the Outbound™ Laptop System, no small idea when it comes to expanding the power of your Macintosh SE or Macintosh Plus. Sharing your most essential business information between your Macintosh desktop and your Outbound Laptop is only a *point and click* away.

When docked\*, your Macintosh and Outbound function as a single unit. Drag any icon from your Macintosh SE or Plus over to your Outbound Laptop System. Or take files back the other way without using a single utility. Together they can do some amazing things to make your Macintosh experience — twice as rewarding.

Like getting the job done in half the time by doubling operating speed; or making your work all the more visible with the addition of the Outbound's backlit LCD — which works with your Macintosh display. With the increase in system memory and storage capacity, you get to expand your desktop that much further.

But to properly size up the Outbound's real potential requires a slightly more detached point of view. On its own, the Outbound Laptop gives you the freedom to express yourself while on the road — becoming a standalone Laptop and running all of your favorite Macintosh applications. And because of Outbound's innovative silicon disk — your software will perform at a recognizably quicker pace, which is especially important if you happen to be on the fast track.

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Write:

Outbound Systems, Inc. (Formerly Wallaby Systems, Inc.) **4840 Pearl East Circle** Boulder, CO 80301

\* The Outbound Laptop requires that an authorized Outbound reseller relocate the ROMs from your existing Macintosh SE or Macintosh Plus. Your Macintosh SE and Plus are fully operational as long as the Outbound Laptop is docked.

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#### The Data Duelists

many of 4D's options. 4D's Report command can be used in a one-line procedure to bring

up the Ouick Report editor. The commands Sort Selection and Print Selection allow a simple report to be generated with sorting - far more straightforward than copying data into a list, sorting it, and printing it.

4D has a search command that lets you build optimized searches with up to 256 criteria.

It's also incorrect to say that 4D can open only one window at a time. You can open as many windows as you like, depending on available memory, although you can enter data only into the top window.

Finally, operations that use transactions are faster than those running without them. Transactions should be used sparingly to optimize the system's responsiveness instead of bogging it down.

Louis Benjamin is an independent Mac consultant living in Brooklyn, New York.

like style sheets in a wordprocessing program. If you change a font in the list, the

program changes it globally. This allows compatibility between applications when you're porting a Mac application to the PC.

Procedure Editing. By default, Omnis 5's procedure editing provides the same functionality as the "wildcard" in 4D, but with one less keystroke than 4D requires, and you can see the selected command as the selection string evolves. Field names automatically show in capital letters in both Omnis 5 and 4D, but in Omnis you can select them from a list, just as you select commands.

Documentation. The documentation for both products is weak, but Omnis 5 ships with a DA that references its manuals, so help is always available.

David Swain of Polymath Business Systems is a teacher of database-system design and programming.

ALSoft, Inc. USoh Marantaggier, Dakkapier

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# Tomorrow's Upgrade For Your Mac Is Only

A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!

### MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

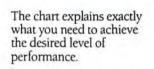
#### PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You don't even need a soldering iron. Just open your Mac, slide out the main circuit board, and plug in your memory card. Complete installation instructions are included with each memory kit.



### WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@\$89each).



To more do o

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sock- ets for future expansion.
2½ MB	Remove only two 256K SIMMs, install two 1M SIMMs.
4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, or SE30 to this amount of memory	Do this: (install in multiples of four only)
4 MB	Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.
8 MB	Remove all four 256K SIMMs install eight 1M SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just \$15.

#### WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

\*Prices can vary a lot, based on quality, speed and demand. At press time

our price for 1MB, 120 ns Memory kits is \$89. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

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Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor 120 ns (or faster) chip, and the

needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

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Place your order by 12:00a.m.(E), week-days and we'll deliver overnight for just \$3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

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If, for any reason, you are dissatisfied with your MacWarehouse Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

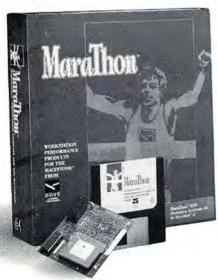
Turn your Mac into a System 7 Powerbouse for only \$4

n a matter of weeks, Apple will release SYSTEM 7 and make it available to all existing Mac users! And there's a large pool of SYSTEM 7 software ready to run RIGHT NOW! Soon, the multi-tasking capabilities of SYSTEM 7 will allow your Mac to run new and much more powerful applications.

But this new intelligent software will make the Mac more "powerhungry" than ever. And to fully utilize SYSTEM 7 you'll need a 68030 processor which gives access to virtual memory — allowing the computer to use your hard disk as extended RAM.

#### PRICE BREAKTHROUGH!

Thanks to some ingenious new technology, we're able to offer the Dove Marathon 030 upgrade, including the necessary 68030 processor for the astonishing price of \$449.



You'll be amazed at the increase in speed of your present applications with the Marathon 030 Upgrade.1 You'll race through graphics and database processing at speeds equivalent to computers costing thousands more. And as soon as SYSTEM 7 is available - you'll be ready to run the new applications.

#### WHAT DO I NEED?

The upgrade is easy to install in not much more than half an hour and comes with complete step-by-step instructions. You may need a simple tool kit to open your Mac - price

To run SYSTEM 7 you must have at least 2 megabytes of RAM, and an enhanced (128K bytes) ROM. The Mac Plus, SE, SE/30 and the Mac II series all have the enhanced ROM, so the only other expense is an extra megabyte of RAM if your computer only has 1MB. Since you have to install 1MB memory chips in pairs. this could cost about \$200.

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MACWAREHOUSE 120 DAY GUARANTEE

In addition, every item we sell comes with the MacWAREHOUSE 120 Day Guarantee. If your selection is defective in any way, all you have to do is call for a return authorization number. Defective software will be replaced immediately. Defective hardware will be replaced or repaired at our discretion

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To keep your newly upgraded system on track, we've bundled two state-of-the-art maintenance utilities with this offer. SAM 2.0 - Symantec Antivirus for Macintosh operates to identify and eradicate viral infections. SUM II - Symantec Utilities for Macintosh is used for more urgent disaster relief such as crashed disk and deleted file recovery, back-up and security.

SYSTEM 7.0

#### **CALL NOW!**

Don't miss the chance to supercharge your Mac to SYSTEM 7 capability now. Our helpful staff of Mac fanatics is standing by to take your call. We'll help you select just what you need and get you off and running on the new system!

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1 MaraThon 030 will not work with Mac 128/512.



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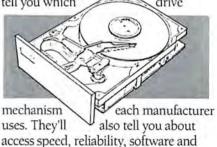
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Between now and May 31st MacWarehouse is offering savings on every hard drive we sell. So, if you're thinking of buying a new hard drive, your timing couldn't be better. Check

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CMS, MacStack	429	\$100	499	\$46	589	\$36	649	\$50	769	\$30	839	\$36
Dolphin, Integra	389	5110	439	\$156	499	\$220	589	\$189	645	\$350	799	\$340
PLI, Infinity Turbo	-	-	569	520	619	\$26	4-	-	-	-	999	5120
*Quantum Internal	-	12	-	-	399	\$126		à,	649	\$220	4	/=

Savings are calculated from MacWarehouse December 1989 published prices. \*Quantum drives are for internal installation and require a 3.5 Internal Drive Kit for \$75 \*\*PLI is a 50meg turbo drive. \*\*\*40 + meg Removable Cartridge Drives come with 1 cartridge. Additional cartridges available.

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## OVERNIGHT DELIVERY

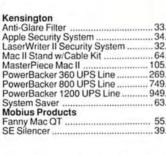
White Knight 11.0 (Freesoft)

White Knight is Scott Watson's successor to the legendary Red Ryder telecommunications program. It's more than just a new version - the added new features list alone is more than 20 pages long! The 270+ pg. manual has plenty of step by step tips to help beginners communicate like the pros in no time. White Knight comes bundled with Okyto, a revolutionary Mac-to-Mac file transfer program. A free subscription to the GEnie network is also provided. (communications) \$85.

Ergotron
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MacTilt II-RGB75.
Goldstein & Blair
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ICD
Graflex84.
I/O Designs
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Macinware Mac II Carrying Case 99.
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#### UnMouse (MicroTouch)

The UnMouse does everything a mouse can - only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection, merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Requires a Mac with ADB port. (input) \$189.



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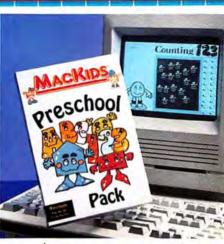


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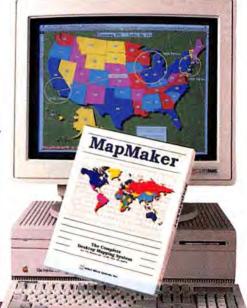


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Laser 3.5 Diskettes ......29.

HardTop ImageWriter Covers ......... 17. Keyboard Flip
Dust Covers - Grey Nylon Ripstop
ImageWriter or LaserWriter

Mac Plus and keyboard ......11.
Mac SE & extd. or reg. keyboard ......11.

Computer Tool Kit (52 pc.) ......

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American Power Conversion

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of the staff of Mac-Warehouse U.K. and find out how the Mac is making out in Europe!

Your name is automatically entered into the drawing when you order from Mac-Warehouse. (Or just mail the entry coupon.)

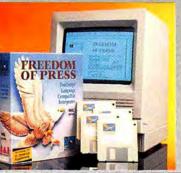
And don't forget, nobody beats Mac-Warehouse for great prices, free technical support and our Midnight Express Service. Order until twelve midnight for overnight delivery. The price is still just \$3. Nobody does it faster than MacWarehouse — nobody!

Dreams (Innovative Data Design)



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## ROM MacWAREHO



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March to the tune of a MIDI drummer. Compose patterns, songs and jams. Sound output via Mac or MIDI, exports MIDI files for use with sequencers. Enter notes in real time, or drag notes into place with the mouse. Very easy to use! (music) \$ 59.



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Power Packed Palette! Jammed with features, Easy Color Paint with features, Easy Color raint delivers thrills and excitement to any would-be Piccaso within mouse-reach of your Mac. In-cludes 17 tools, 256 colors, user defined patterns, multiple color palettes, coloring modes and much more. (graphics).



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AEC Management Systems	
AEC Information Manager	409
Blyth	
Omnis 5	375
Claris	
FileMaker II	219
Fox Software	
FoxBASE+/Mac	295
Odoeto	
Double Helix III	339
GeoQuery	198
Panorama	257
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#### DESK ACCESSORIES

DESIX ACCESSORIES
Casady & Greene QuickDEX31.
JAM Software
Smart Alarms & Appt. Diary49.
Smart Alarms (1 - 4 users)99.
Smart Alarms (5 - 8 users) 149.
Smart Alarms (9 - 15 users) 199.
Smart Alarms (16-25 users) 299.
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Vantage 1.552.
Solutions
SmartScrap & The Clipper 2.0 45.
Vision Software
Form Layout35.

#### 110 SE UPS (American Power Conversion)

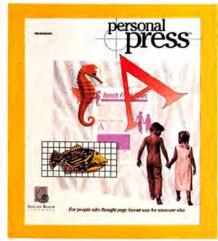
It fits neatly under your Mac and provides up to 20 min-utes of clean power. A built-in rechargeable battery prevents data loss and equip-ment damage. During normal operation, it protects against surges, spikes and power line noise. (accessory) \$269. Power Chute

Upon power failure Power Chute alerts all network users and initiates a graceful shutdown of the Ap-pleShare Network. It com-municates with a signalling American Power Conversion UPS (such as the 110SE or 307ci). (utility)



#### DISK DRIVES/BOARDS

CMS		
MacStack 20 Meg		429.
MacStack 30 Meg		499.
MacStack 45 Meg	***************************************	589.
MacStack 60 Meg		
MacStack 80 Meg		769.
MacStack 44 Meg	Removable	839.



Personal Press (Silicon Beach) Personal Press creates professional layouts for you. Forget the long, steep learning curve, because Personal Press has AutoCreate to assemble stories and graphics into templates. It includes a full-featured word processor with spelling checker and thesaurus, controls for scanned images, spot color separations, posted notes, link navigator, extensive page previewing, and on-line help. (desktop publishing) \$199

Flipper 44 Meg	829.
Fuiitsu	
800K Disk Drive	159.
Kennect Technology	
Drive 2.4	329.
Rapport	199.
Peripheral Land, Inc.	
Infinity Dual Turbo	1875.
Infinity Turbo 40 Meg	
Turbo Floppy 1.4	359.
Quantum	
Quantum 40 MB Raw Drive	465.
Quantum 80 MB Raw Drive	735.
RasterOps	
RasterOps Colorboard 264	755.
A CONTRACTOR OF STREET	

Integra 60 Meg ......589.

Integra 80 Meg ......645.

#### EDUCATIONAL/ PERSONAL.

Beacon Technology	05
GEMS of the Word	25.
Alphabet Blocks	30.
Talking Tiles	
Davidson	
Math Blaster Mystery	26.
Speed Reader II	26.
Fair Tide Technologies	
Navigate! mono1	99.
First Byte	
The Dinosaur Discovery Kit	27.
The Puzzle Storybook	27
The Rhyming Notebook	27.



#### DESKTOP PUBLISHING

Aapps	075
MicroTV	2/5.
Aldus	
PageMaker 4.0 or PrePrint	Call.
Broderbund DTP Advisor	
DTP Advisor	47.
Data Translation	
PhotoMac	609.
Emerald City Software	
Smart Art I, II, or III	ea. 84.
Letraset	
ColorStudio or FontStudio	Call.
ImageStudio	2/5.
Ready,Set,Gol	2/5.
Olduvai	
Read-It! 2.1 (OCR)	245.
Read-It! Personal 2.0	125.
Read-It! TS (ThunderScan)	79.
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QuarkStyle	
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Dolphin Systems Tech
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Integra 30 Meg439.
Integra 40 Meg499.
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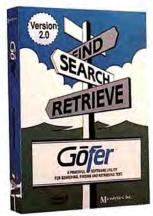
The "ULTIMATE" SE Carrying Case

(I/O Design, Inc.)
The "ULTIMATE" SE Carrying Case is designed with the same high quality stan-dards as other MacLuggage products.

This case offers internal, padded compart-ments for ANY Macintosh keyboard, mouse, external hard disk and cables. It also features 2 additional exterior pockets for everything from disks to umbrellas. Combine these features with sturdy Du-pont Cordura nylon and 1/2 inch high density foam padding and you'll see why this is the "Ultimate" carrying case for your Mac. (accessories) \$79.

#### BUSINESS & PRESENTATION

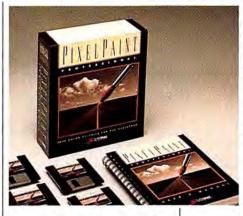
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Healthcare or Finance & Banking	02. 30
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Cricket Presents	205
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Imagine That! Extend	220
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Informix WingZ 1.1	040
	249.
Kaetron	400
Top Down	199.



GOfer (Microlytics)

The ultimate text finder. A powerful soft-ware utility that searches, finds and retrieves text. Searches through countless files on your hard disk drive or floppy disks to find the text you need. A phrase, a fact, a note, a date. If you need it, GOfer finds it in seconds. You can automatically import the section of text into the docu-ment you're currently working in. You save hours searching through files. GOfer operates as a Macintosh desk accessory. (utility) \$45.

Microsoft
Excel 2.2 or PowerPoint 2.1 ea.249.
The Microsoft Office529.
Works 2.0
Portfolio Systems
Dynodex-w binder & paper95.
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Power Up
Address Book Plus53.
Address Book Plus w/Binder99.
Calendar Creator38.
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Endeavour Planner95.
Symantec
More II 2.01 269.
Symmetry
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PixelPaint Professional (SuperMac Technology) PixelPaint Professional's photo-realistic paint capa-bilities let your imagina-tion tinker with reality. Don't settle for manipulating images...create them with PixelPaint Professional! Offers an array of advanced paint tools for dazzling special effects. Choose from full transparency control, dynamic masking, image merging and a sophisticated air-brush tool. Use 8-to-32 bit color while selecting from a spectrum of custom palettes and color pickers including 4-color process, RGB, and PAN-TONE. (graphics) \$389.

SYNEX	9.
FastLabel 2.089	9.
CAD/CAE	
Claris   ClarisCAD   598   Graphsoft   MiniCad+2.0   518   Innovative Data Design   MacDraft   178   I.S.I.   Precision   158   Strata   158   Strata   158   15	9. 5. 5.
StrataVision 3D	5.
CE Software In/Out (1 to 5 Users)	9. 4. 9. 9. 5.

SYNEX

Dow Jones
News/Retrieval Membership24.
Farallon
Timbuktu 3.095.
Timbuktu Remote 1.0.1
TrafficWatch 125
PhoneNET PLUS33.
PhoneNET Repeater315.
PhoneNET Star Controller 825.
FreeSoft
White Knight 11.085.
Infosphere
Liaison 175.
InSignia Solutions
Soft PC (Mac II)245.
Microcom Software
Carbon Copy Mac119.
Prodigy Mac Starter Kit27.
Mac Starter Kit27.
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Teleconnectors
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Dynodex-w/binder & paper

Manages your names and ad-dresses faster than anything on the Mac: dial, find, change, sort, select, import, export, merge, and more. Includes "no fuss" forms to print 300 double-sided pages to Filofax and other personal organizers. (business) \$95.



MicroPhone II 3.0

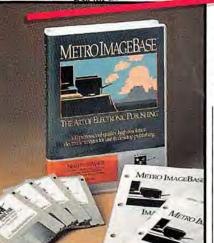
MicroPhone II scripting lan-guage makes using electronic mail services an automatic opmail services an automatic operation. Other types of file transfers are equally effortless. Micro-Phone II now supports the hot new ZMODEM, transfer protocol (in addition to XMODEM, YMODEM, KERMIT, and MacTerminal 1.1), and can operate moderns at any speed. erate modems at any speed from 50 to 57,600 baud. (communications) \$215.



CanOpener 1.1

Information retrieval utility for the Mac. Search anywhere, and lets you retrieve just about any-thing; including text, pictures and sounds. Locates text inside pictures, and gives you the whole picture! Anything you retrieve with CanOpener can be stored in its library, so the next time you need it, it's just a click away. (utility) \$64.

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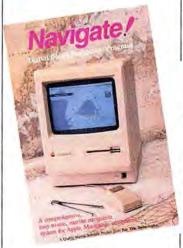
Help Software, Inc.	
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Miles Computing Fool's Errand	32.
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High quality 300 dpi electronic art from one of the world's leading publishers of ready to use art. Enhance brochures, menus, reports, newsletters and presenta-tions. One large image per file - 100 per package. Packages available: Newsletter Maker, Business Graphics, Computers & Technology, ReportMaker, Borders & Boxes and 9 others. (graphics) \$76. each

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Cribbage & Gin King	30
Life & Death or ChessMaster	22
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Pool of Radiance	32.
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Sands of Fire	32.
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NFL Challenge	
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Smart Alarms desk accessory creates reminders which interrupt you at an appointed time. Features snooze up to to 1 hour, printing, choice of beeps, & text editing reminders. Ap-pointment Diary desk acces-sory calendar for appointments. Features: Auto-layout, Day Layout, set reminders directly into Smart Alarms, Week at a view, Month at a glance, printing. Multi-User requires AppleShare or TOPS. (desk accessories) single user \$49, 1-4 users \$99, 5-8 users \$149, 9-15 users \$199, 16-25 users \$299

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Fontogra	apher 3.05	5	 249
Metamo	rphosis	**********	 149
The Art I	mporter 2	.0	 89
Emeralo	City Sof	tware	
TypeAlic	ın		 60
Letraset	t		
LetraStu	dio		 275
LetraFor	nts (variou	s)	 ea. 69
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Easy Color Paint	45.
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Navigate! (Fair Tide Technologies)
Enter the world of Digital Chart Navigation. Navigate! allows you to display the precise position of your yacht on a detailed chart. Displays land mass, shoal lines, buoys and many other navigation aids. Has full course planning and tracking features. Includes interface for a position sensor (LORAN, SATNAV, GPS) and one chart. Available in color or mono. (education)
Navigate! mono \$199.

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Blueprint	339.
Innovative Data Design	
Dreams	325.
MacroMind	
MacroMind Director	445.
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#### TaskMaker (XOR)

The world has plunged into depression and devastation...the once nighty kingdom is no longer. Your mission: to restore order and prosperity to the kingdom, but you have no experience. Explore lands, caves and castles.
Discover precious riches,
decipher cryptic messages
and fight hellish beastles
such as skeletons, zombies and giant caterpillars. To gain help, find the Task-Maker. With his guidance and your courage, the kingdom might be saved! (entertainment) \$29.

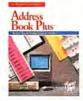


#### 2400MFAX

"Just the Fax Ma'am...Just the Fax" Not anymore when you combine high-end fax capabilities with the power of your Mac! Part of the new Promodem Data/ Fax Series, the 2400MFAX adds Fax Series, the 2400MFAX adds Group III, originate-only and 4800bps fax capabilities to the enclosed 2400bps data modern. Includes MAc-KNOWLEDGE and a customized version of BackFAX. (modern/fax) \$209.



Play it by ear! Beginners and pros alike can hone their ear pros alike can none their ear training skills when they Listen. You'll love using this exciting software package to master varying degrees of note, chord and interval recognition via an on screen piano & guitar or your external MIDI keyboard. (music)



#### Address Book Plus

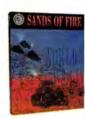
The most complete, ready-to-use solution for managing names, addresses, phone numbers, and other vital informa-tion. The program makes it easy to print top quality address book pages, phone lists, mailing labels, rotary-file cards, and envelopes. Also includes a sepa-rate Desk Accessory for searching and dialing. (business) \$53. With leather binder \$99.





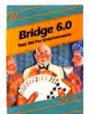
## REHOUSE





#### Sands of Fire

Venture into the white-hot sands and sweltering intensity of WWII North Africa. Thoroughly documented with accurate historical data, Sands of Fire recreates actual battle scenarios of tank warfare in WWII. You can influ-ence the outcome of up to 48 different battle engagements from Tobruk to the Kasserine Pass and more. (entertainment)



#### Bridge 6.0

Bridge 6.0 is a comprehensive contract or duplicate bridge playing program which allows you and your computer partner to bid against two computer opponents and play out the hand. Ideal way for the novice to improve his or her game, and advanced player to get into a game without having to round up three additional players. (entertainment) \$24.



#### Pool of Radiance

The fabled city of Phlan has been overrun by monsters led by a mysterious leader. Your quest: discover the identity of this evil force and rid Phlan of its scourge. The Adventurer's Journal will helpguide your party on many different missions with history, maps, clues and ru-mors. (entertainment). \$32.

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SuperMac	
PixelPaint 2.0	225
PixelPaint Professional	
Tactic Software	303
Art Clips Vol. 1	E1
Art Clips Vol. 2	
Art Clips Vol. 2	65



## MacEnvelope Plus MacEnvelope MacEnvelope Phus

#### MacEnvelope 5.0 (SYNEX)

either replace existing keypads or other-wise be added to the keyboard. This

ules into a single unit. Additionally, the Switchboard is the first keyboard that is engineered to work on both IBM and Apple computers. (input/output) \$175.

**HYPERWARE** 

MacEnvelope 5.0 delivers the look you want for per-sonalized mail. Import self-styled graphics and text to create unique enve-lope and label layouts. And save money on bulk mailing and speed delivery using MacEnvelope's Postal Bar Coding ability. Stores up to 1600 addresses per file, sorted alphabetically or by ZIP code. (business) \$79. MacEnvelope Plus 2.0 Maintains up to 100,000 names per file. Provides list management features including comments, flags and multilevel sorts. (business) \$219.

#### HARDWARE & PERIPHERALS

Cutting Edge	
Two Page 19" Monochrome Monito	or 959.
General Computing Company	
WriteMove Ink Jet Printer	575.
Magnavox-	
Color Monitor 14"	535.
Microtek	
Microtek MSF-300GS Scanner	1589.
Mobius	
Multiscreen Video Card w/	
Princeton 15" monitor	529.
Qume	
Crystal Print Publisher	.2900.
Seikosha America	-
Seikosha Printer (dot-matrix)	235.
Sharp	
The Wizard	229.
ThunderWare	
LightningScan	369.
ThunderScan 5.0	187.

Springboard	
Family Matters	28
Symmetry	
	49
TimeWorks	
HyperWorks Organizer	57

#### INPUT/OUTPUT Altra

#### Felix (Altra)

Finally, a stationary mouse alternative Thiany, a stationary frouse alternative, that's quicker and easier to use. Felix uses just six inches of desk space to provide full speed cursor control. It utilizes Altra's "Optical Pointing Technology" and an onboard microprocessor to achieve very high resolution combined with simple use. Felix is more than a mouse, it's a productivity tool! No maintenance required. For all Mac SEs and IIs. (input) \$127.



#### HyperDialer (DataDesk International)

Now you can connect your Macintosh to your existing business or home telephone for auto-matic dialing with Apple's HyperCard. Dat-aDesk's HyperDialer is designed specifically for HyperCard's touch-tone dialing capabilities and works with-line business phones without requir-ing a modem or dedicated phone line for auto-matic dialing. Automatically dials HyperCard, SideRick, Focal Point, C.A.T., SuperCard and QuickDex phone numbers. It connects to the speaker port - not a precious serial port. (hyperware) \$29.

Asher Engineering	
QuadLYNX Trackball	59.
Cutting Edge	
CE-105 ADB Keyboard12	25.
DataDesk Intl.	
DataDesk Switchboard17	75.
Mac 101 Keyboards 13	39.
International versionsCa	all.
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New Turbo Mouse10	)9.
Kraft	
ADB Joystick Premium III (SE&II)4	
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Mobius Cordless Mouse	15
	15.
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Practical Solutions	9.
	0.5
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Mouse Master	11.
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#### LANGUAGES

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Zedcor	
ZBasic 5.0	89.

#### MEMORY UPGRADES/ ACCELERATORS

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Low Profile, 120ns High Quality Single In-Line Memory Modules for MacPlus, SE, II, IIx. ONLY \$89. 2 yr. Warranty.

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MacSnap 524S	239.
MacSnap 548S	

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Abaton	
InterFax12/48	265
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SmartOne 2400/1200	145.
Dove	
DoveFax desktop	279.
DoveFax Networkable desktop	375.
DoveFax Nubus	449
Networkable Nubus	749.
Hayes	
Smartmodem 2400	
Smartmodem 9600 (V series)	759.
The second second second second	



#### TOPS 3.0 Network Bundle for the Mac (TOPS)

TOPS 3.0 provides a completer network/ E-Mail solution for any combination of Macs, IBM PC's and Sun workstations. With TOPS, every computer is a server and each user decides which files are public or private. TOPS follows AppleTalk File Protocol, so AFP-compatible multiuser applications will run properly. In-cludes TOPS Spool for background print-ing on the network, and a 20-user package of InBox 3.0 (networking) \$189.

Prometheus	
2400MFAX	
ProModem 2400 SE Int	209.
ProModem 2400M	
Travel Modem	205
Supra	
Supra Modem 2400	129.
US Robotics	
Courier 9600 Modem	689.

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MIDI Interface	59
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Practica Musica 2.2	69
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Deluxe Recorder	
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MacRecorder (records sound)	159.
Screen Recorder	125.
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SmoothTalker	32
HIP Software	
Harmony Grid	50
Passport Designs	
NoteWriter	225
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Passport MIDI Interface	69.
Primera Software	
Different Drummer	59.
Repertoire	

#### FastLabel 2.0 (Vertical Solutions)

Music Publisher ..

Stick it to the chore of simple label printing! FastLabel offers a handy easy-to-use solution to creative label printing without the need to haul out cumbersome desktop publishing software. Import addresses, lists and graphics from other Mac applica-tions then use Fastlabel's eighteen preformatted designs (or create your own) to produce everything from disk, V.C.R and cassette labels to personalized envelopes, name badges, signs and more (business) \$89.

#### MacTilt (Ergotron)

See eye to eye with your Mac and watch productivity soar! Raise your Mac to eye level using MacTilt's 4 inch pedestal. Then tilt it up to 30 degrees and rotate it a full 360 degrees to make glare, eye, neck and back strain disappear like magic. (accessories) \$68.

Resonate	
Listen 2.0	62.
Tactic Software	
Sound Clips Vol. 1 or 2	ea. 49.
odding Olips Vol. 1 of 2	ea. 49

#### SECURITY & VIRUS PROTECTION

ASD Software, Inc.	
FileGuard Extend (office 5-pak)30	9.
Fifth Generation	
Disk Lock 10	17
HJC/Microcom	
Virex 2.35	2.
Kent Marsh	
MacSafe II10	7.
NightWatch 8	
QuickLock5	6.
Mainstay	
AntiToxin5	9.
Symantec Corporation	
S. A. M	8.

#### SmartOne 2400 Modem (Best Data Products)

For beginners and experienced modem users If you need a 2400 baud modem, the Smart One 2400 Modem provides an economical alterna-tive. For less than the cost of some 1200 bps units, you get a Hayes compatible modem with auto answer/origi-nate, 300, 1200 and 2400 baud operation, pass-through phone lack, speaker with programmable volume,

and a manufacturer's two-year warranty All user options are stored in non-volatile memory. Includes software and cable. (moderns) \$145.

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BigThesaurus64
Spelling Coach Pro 3.1125
Electronic Arts
Thunder II49
Lexpertise
MacProof 3.2.1115
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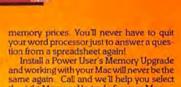
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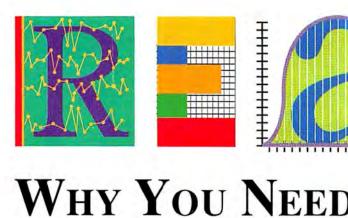
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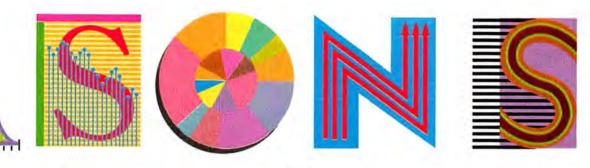
#### **Charting Programs**





Thinking of buying a
stand-alone charting
program but not sure if
it's worth it?
Here are the top ten
reasons why you need a
charting program now.

any people are still using their spreadsheet programs to create charts, and in general, these programs do a pretty good job. In fact, several spreadsheets now sport beefedup charting modules. If that's the



## A CHARTING PROGRAM

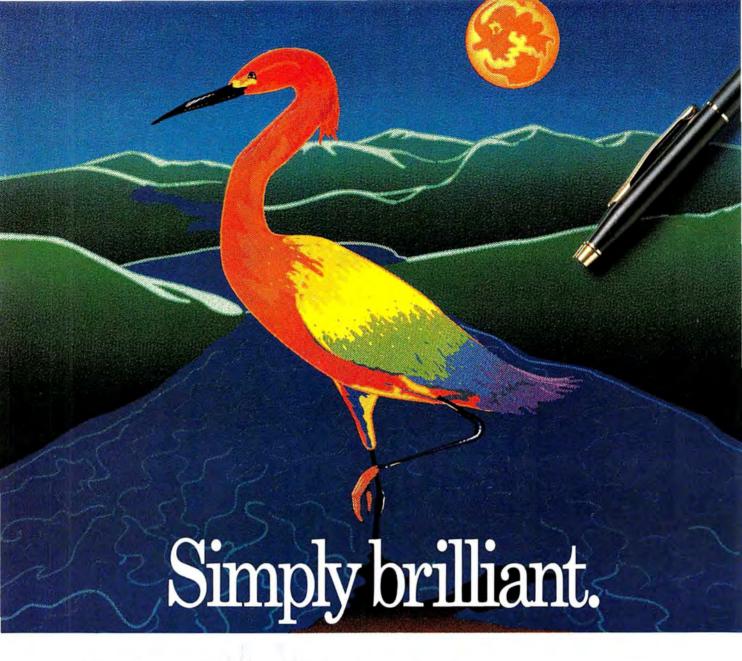
case, is there any point in spending your money on a stand-alone charting program?

There certainly is, especially if you feel constricted by your spreadsheet program's charting capabilities or if you create a lot of charts for business or scientific presentations. A stand-alone charting product not only offers a wider variety of chart types, but it can

also make the job faster and easier and the results more accurate and much more attractive.

The five charting programs presented here — Cricket Graph, DeltaGraph, Igor, KaleidaGraph, and Visual Business Systems No. 5 (VSB#5) — have features guaranteed to leave your spreadsheet's charting module in the dust. These ten reasons show you why.









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#### 10 Reasons Why You Need a Charting Program

#### **Easy Data Importing**

The ability to import data from a spreadsheet program, database manager, or word processor can save a lot of time when you're constructing a chart.

All of these programs let you import ASCII text files, and most can import spreadsheets formatted in SYLK. In

addition, Cricket Graph can import PC spreadsheets formatted in WKS.

If you're looking for easy text-file importing, KaleidaGraph has the best capabilities. KaleidaGraph's Data Import window lets you see the data's format, and you can change the field delimiters to any ASCII character, allow for multiple delimiters between records. decide whether or not to read titles, and note how many lines to skip before entering data (see Figure 1). You can also enter control strings for reading unusual titles or data formats.

DeltaGraph can establish an interactive link with Excel, and once that link has been established, changes made and saved in the Excel file are reflected in the Delta-Graph chart the next time it's updated.

#### More Charts for Your Money

Although Wingz, Full Impact, and Excel offer many types of charts (including 3-D charts in Wingz and Full Impact), you still get a much wider selection of chart styles and more features in a stand-alone program.

Just for starters, VBS#5's 3-D text charts let you flow text toward or away from the vanishing point (see Figure 2), Igor has area charts that show positive and negative values on the x-axis, Cricket Graph has QC (quality control) charts for production control — useful for verifying that performance is within control

EALLY GOOD

CHARTS ARE THE RESULT OF FINE-TUNING — EASY TO DO WITH A STAND-ALONE CHART-ING PROGRAM.

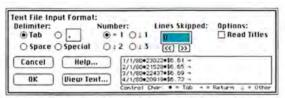


Figure 1: All charting programs let you import a variety of formats — from spreadsheets, to text, to PC files — and KaleidaGraph's data-import window is one of the best. It gives you several ways to adapt the text, and it lets you view the text to check your settings.



Figure 2: Charting programs have many features that make it easier to create presentation-quality charts than it would be with a spreadsheet program. Visual Business Systems No. 5, created solely for the presentation market, uses transparent layers so you can place a graphic behind a text or data chart.

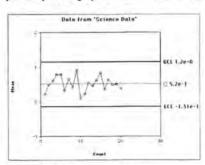


Figure 3: Charling programs offer numerous chart types — with different programs specializing in different types of charts. Cricket offers eight statistical variations on quality-control charts. A chart such as this one permits you to see at a glance that the process you are charting remains within control limits.

limits (see Figure 3), KaleidaGraph's box plots let you examine multiple variables globally (see Figure 4), and DeltaGraph offers multiple- and stacked-pie charts (see Figure 5).

#### **Ability to Massage Your Data**

Before you transform data from numbers to pictures, you often want

to reorganize it to give the chart greater impact.

All these programs, except VBS#5, let you change rows to columns, transform data by applying simple arithmetic functions or complex operations to it, and combine data from several columns into a new column. KaleidaGraph and Igor let you type in your own formulas directly to create new data columns. KaleidaGraph also has a built-in imitation Hewlett-Packard programmable calculator with 100 memory registers that is capable of remembering 1,000 program steps. The calculator can be used to build and run macros.

#### Ease of Use

Don't worry that you'll have to spend hours learning how to use these programs—even someone with little number-crunching ability can turn out an impressive chart quickly with one of them. It's very easy to get an initial version of a chart on-screen, and with a little experience,

you can quickly see which elements of the chart need refining.

#### **Fine-Tuning**

The secret of a really good chart is in the fine-tuning, and that can be much more difficult to do with a spreadsheet charting module than with a stand-alone charting product. Have you ever tried to clean up the mess left when the x-axis labels overwrite in your spreadsheet-generated chart? Or tried to align a transparent chart on top of another chart in Full

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#### 10 Reasons Why You Need a Charting Program

Impact? Stand-alone charting programs offer easy solutions to these and other problems that spreadsheet programs don't handle well.

For instance, when you're creating a chart, you often want to rotate text, especially axis labels, which is possible in a charting program. Spreadsheet programs, on the other hand, can rotate only axis titles.

The ability to put a graphic behind a chart, which you can do with VBS#5 and Delta-Graph, is also very convenient. These programs also have refined 8-bit-color control, which enables you to put attractive color shadings behind your charts.

#### Superior Presentation Capabilities

Although none of these charting programs comes with templates, you can create your own templates or macros so that you can save a chart format and use it again with new data.

Igor and KaleidaGraph are especially good for creating macro-based templates — virtually anything the charting program can do can be included in the macro.

DeltaGraph and Igor are the best choices if you want to be able to print out really big charts on more than one page. The results are impressive, even if you have to assemble the finished product with scissors and tape.

#### Easy Replotting

The ability to select part of a chart for replotting is a real advantage. KaleidaGraph lets you draw a polygon around some of the data points in a chart and then redraw the chart, masking those points outside the polygon. In Igor, you can drag a marquee over part of the chart and then shrink or expand the area horizontally, vertically, or both ways simultaneously. Igor also lets you rescale your data (see Figure 6).

AVING A CHART
FORMAT IS SIMPLE WITH
CHARTING PROGRAMS
THAT ALLOW YOU TO
CREATE MACRO-BASED
TEMPLATES.

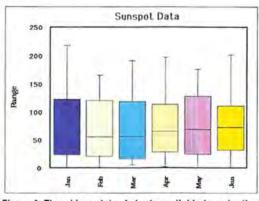


Figure 4: The wide variety of charts available in a charting program means it's simple to create scientific or technical charts. This box plot, done in KaleidaGraph, represents sunspot data over a five-month period. The bars represent the maximum and minimum values for the data series.

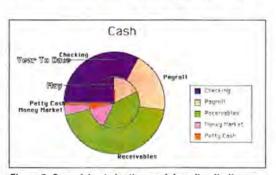


Figure 5: Spreadsheet charting modules often limit your choice of charts. A charting program gives you a wide variety of standard and unusual charts, such as Delta-Graph's stacked pie, illustrated here. Another option available in DeltaGraph is multiple-pie charts.

#### Ability to Create Complex Technical and Scientific Charts

Scientists, engineers, and mathematicians often don't need presentation tools such as 3-D or slide-show effects in charting programs. They're more likely to want features such as superscripting and subscripting, the ability to type in a formula and see the wave charted immediately, layout

ability for complex pages, and multipage chart printouts.

Igor is the best tool in such situations. It has a fairly standard Mac interface, but it's built around a command line connected to a command-history window. You can essentially run the program from the command line and, in doing so, produce a history that can be cut and pasted into a macro window, enabling the process to be easily replicated on a new batch of data.

You can also create attractive charts with more-specialized software, such as Gen-Rad's Parameter Manager PLUS, which has a strong engineering slant, and Abacus Concept's statistical program StatView II.

#### Easy Chart Annotation and Report Generation

All of these programs let you annotate charts and add arrows, but the best drawing tools are found in DeltaGraph, which even supports Bezier curves.

Technical charts often call for the addition of error bars or regression curves — Igor is probably the best choice for this. Both Igor and Kaleida-

Graph can produce statistical reports on a chart's data, and Igor has report generators that let you assemble a full-page report, with header, chart, and report text in page view (see Figure 7).

#### **Plenty of Output Options**

Macintosh charting programs offer almost as many output options as



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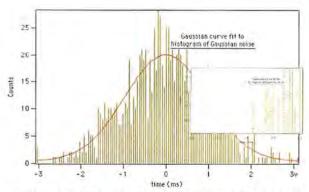


Figure 6: Charting programs let you replot sections of a chart. Igor allows the easiest replotting: You just drag a rectangle over the part of the chart to be viewed. A pop-up menu lets you expand or shrink the selected area.

#### **Special-Purpose Tools**

These two special-purpose charting programs are no substitute for a general charting program, but if you do a lot of chart work, these programs will help you deal quickly and efficiently with specific tasks.

#### Data Scan

Data Scan transforms charts back into their original data. It interprets a scanned image of the chart on paper and then produces its own version on-screen, allowing you to reset the scales for the x- and y-axes. You can save a tab-delimited text file of the data for statistical analysis or recharting,

Data Scan is remarkably accurate, and it can work from TIFF, MacPaint, FOTO, or ThunderScan files. It interprets line, bar, and scatter graphs, and there are tools for smoothing, identifying individual points, and editing plotted points.

The manual includes practical advice on how to tinker with aspects of the chart to get better results, although it shows its age by mentioning Switcher but not MultiFinder.

#### Data Scan

BrainPower, Inc. 30497 Canwood St., # 201 Agoura Hills, CA 91301 (800) 345-0519 or (818) 707-1712 \$199.95

#### FlexiGraphs

FlexiGraphs is a clever, intuitive tool that helps you visualize your "what ifs" by supplying the data to back up any free-form chart that you draw on-screen.

When you open a new chart in FlexiBar, FlexiLine, or FlexiPie, there is already data and a plot. If you resize a pie wedge, for instance, the other wedges also are adjusted in any way you choose — proportionally, evenly, or by increased total.

You can build formulas between variables of a bar chart so that adjusting one bar proportionally adjusts the others. A magic-wand tool lets you reshape the curve or adjust all the bars in a single motion.

FlexiGraphs has eight colors and can save data and charts (which can be exported as PICT documents). Its documentation is excellent.

#### FlexiGraphs

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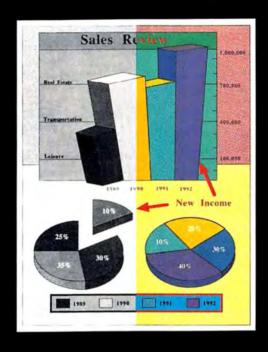


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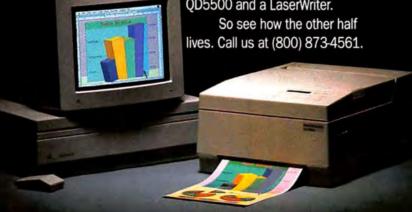
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#### 10 Reasons Why You Need a Charting Program

chart types, including the Image-Writer, plotters, and high-end film recorders.

All these programs can run on a Mac Plus (except VBS#5, which needs a Mac II or later for its 8-bit

color) and print out on an ImageWriter. In addition, VBS#5 includes an Output Manager that lets it send its output in batches to highend output devices such as film recorders and color printers, including

those without Macintosh drivers. DeltaGraph can save files in EPSF. and it, as well as KaleidaGraph, can save PostScript comments in PICT files, resulting in very-good-quality output.

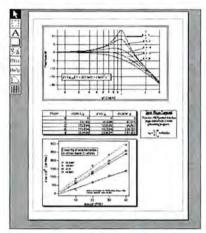


Figure 7: Charting programs offer many output options. Igor's page-layout feature lets you write formulas and assemble multiple elements on the page, including part of a data sheet and a block of free text.

#### On the Horizon

Upgrades to three of the charting programs described here will be shipping this summer. Here's what you have to look forward to:

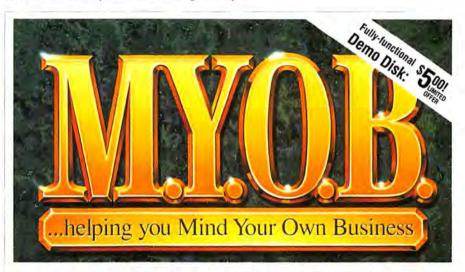
Cricket Graph 2.0 will have 255 columns by 32,000 rows on the data sheet, date/time column format, custom data formats, the ability to plot a specific range from the data sheet, and formula entry for data transformations.

It will add histograms and high/low/ close tables, a 64-color palette, a command to align objects, a zoom view, autoupdate graphs, and better PICT handling.

It probably won't include 8-bit color, 3-D charts, or the abilities to construct charts bigger than the screen or print sheets larger than one sheet of paper,

DeltaGraph 1.5 is a free upgrade to registered users. It will feature more functions, multiple chart overlays, double-Y charts, paired scatter charts, superscripts and subscripts, improved error bars, and the ability to transpose data.

KaleidaGraph 2.1 will feature new plot types, including high/low/close, text, and a table tool, as well as multiple numericdata formats for each window and improved scripting that will let you use macros to create a series of charts.



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#### 10 Reasons Why You Need a Charting Program

Table 1: Features of Charting Programs					
	Cricket Graph	DeltaGraph	Igor	KaleidaGraph	Visual Business Systems No. 5
Missing charts	none	double-Y	stacked-column, pie, stacked-bar, polar	area	stacked-bar
Unusual charts	quality control	3-D, multiple-pie, stacked-pie, contour, table	fill to zero	percentile, box, probability	standard 3-D charts, stacked-column (text, bars with perspective, column pie)
Color	8	256	256	8	256
Import	SYLK, text, PICT	text, SYLK, WKS, Trapeze, Excel	text	text, PICT	text, SYLK, PICT
Export	text, PICT	text, PICT, EPSF, Adobe Illustrator	text, PICT	binary, text, FICT	SYLK, PICT, EPSF
Special	Good plotter drivers. Depth for many chart types.	Multiple-page charts. PICT, EPSF files can be viewed and printed.	Built-in statistical- analysis tools. Multipage charts possible.	Good data-analysis tools. Built-in programmable calculator. Macros.	Output manager batch-prints to film recorders and color printers without Mad drivers.

Note: All programs are assumed to have the following charts: line, area, bar, pie, column, stacked-column, double-Y, polar, scatter, high/low, text, error-bar, and regression-curve. Any variance is noted in the columns marked "Missing" and "Unusual."

#### **Report Cards**

### Cricket Graph 1.3.2

Cricket Graph is a general-purpose charting program that has been around for several years. An upgrade due this summer (see the "On the Horizon" sidebar) will add features such as more chart styles, better color, and improved handling of PICT files.

Pros: Good printer and plotter drivers.

Cons: Major upgrade needed to bring it in line with more recent products.

List Price: \$195.

Cricket Software, 10505 Sorrento Valley Road, San Diego, CA 92121-1698; (800) 531-5236 or (408) 432-1727.

#### DeltaGraph 1.0 \$\$\$\$

If you're looking for a general-purpose package, you'll find DeltaGraph's abilities impressive. With its reasonable price, 3-D charts, 8-bit color, ability to save files in PostScript format, and interactive link to Excel files, DeltaGraph doesn't have many competitors.

Pros: Long list of features; good price; PostScript output. Cons: No double-Y charts; can't enter custom functions or formulas.

List Price: \$195.
DeltaPoint, Inc., 200 Heritage Harbor, Suite

DeltaPoint, Inc., 200 Heritage Harbor, Suite G, Monterey, CA 93940; (408) 648-4000.

**tttt** 

#### Igor 1.1

Igor is intelligently built with a fairly successful Mac interface, but its pie charts are disappointing and it doesn't have any interesting 3-D effects. It has good, if clumsy, chart controls.

Pros: High-powered wave-analysis tools.
Cons: Few chart types; can't adjust font or style of axis labels.

List Price: \$295; External Operation Tool kit, (XOP): \$150.

WaveMetrics, P.O. Box 2088, Lake Oswego, OR 97035; (503) 620-3001.

#### KaleidaGraph 2.02

KaleidaGraph's charting abilities are adequate, but its math abilities are better than either Cricket Graph's or Delta-Graph's. Its data-importing utility is excellent. It has an imitation Hewlett-Packard programmable calculator.

Pros: Feature-rich; excellent import ability; good fine-tuning features; built-in programmable calculator.

Cons: No 3-D charts; only eight colors; chart print-out size limited to one page. List Price: \$249.

Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606; (215) 779-0522.

#### Visual Business Systems No. 5 1.05

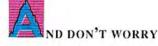
VBS#5 is the only stand-alone charting package aimed entirely at the presentation market. Its 8-bit-color charts are similar to those produced by built-in charting modules in some presentation programs. It includes a modest slideshow utility.

Pros: Batch output for slides and overhead transparencies.

Cons: No templates; doesn't use Mac System fonts.

List Price: \$395.

Visual Business Systems, Inc., 380 Interstate N. Parkway, #190, Atlanta, GA 30339; (404) 956-0325.



ABOUT SPENDING HOURS LEARNING A PROGRAM. EVEN SOMEONE WITH VERY LITTLE NUMBER-CRUNCHING ABILITY CAN TURN OUT AN IMPRESSIVE CHART QUICKLY WITH ANY OF THESE CHARTING PACKAGES.

#### **BetaWatch**

A couple of general-purpose charting programs are due out this summer -MacGraph from Bravo Technologies and FoxGraph from Fox Software.

Based on an early developmental version, MacGraph - with numerous chart types, including 3-D charts, and 8-bit color seems to be taking clear aim at Delta-Graph. There are no polar charts, but others can be used as overlays and transposed on the data.

MacGraph will probably import SYLK, WKS, Excel, MacCalc, and text files. Its early versions suggest that chart elements will be extremely flexible and easy to nudge into the precise position you want.

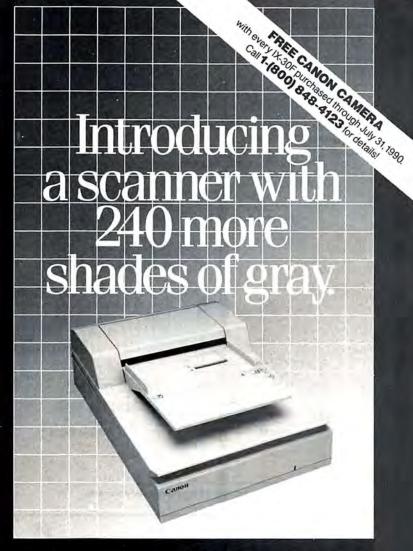
Bravo Technologies, which publishes the spreadsheet program MacCalc, is essentially a one-man show: Rick Ross is president, programmer, marketing director, and tech support. He hopes to have MacGraph on the market this summer for less than \$200.

The other program, FoxGraph, has been in the works for a long time. It began as a development project to bring Harvard Graphics, a best-selling presentation program on the PC, to the Mac. More than a year ago, Fox Software took over the project and demonstrated a prerelease version of FoxGraph at last summer's Macworld Expo in Boston. The program may not be released in time for this year's Expo, but the demo looked promising.

FoxGraph's features list is massive. even including high-end number crunching. The program was originally designed as a presentation package BETA with slide-show capabili-

ties and built-in speaker's

When Fox finally releases FoxGraph, you can expect exotic chart types, spectacular use of color, and a correspondingly high price.



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What's more, it doesn't matter whether you are using a Macintosh,\* IBM\* PC/XT,™ AT,\* or compatible computer. The standard SCSI interface makes it easy to hook up. When you need to expand, you can daisy chain up to 6 additional SCSI peripherals as you require them.

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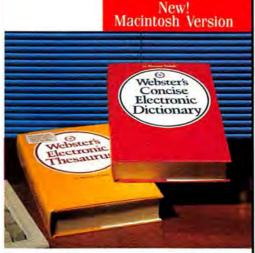
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Cricket Graph and KaleidaGraph have just 8 colors; the other programs offer 256. By sending your color files to a service bureau, you can output slides, overhead transparencies, and high-resolution documents.

One peculiarity of VBS#5 is that it has its own built-in outline fonts, so your system fonts won't show up in the Font menu. It has its own font families, but you can't take advantage of the wide variety of speciality fonts suitable for presentations.

If you're still using your spreadsheet's charting module and are happy with it, fine. But if you've noticed that your competitors are including better-looking charts in their reports than you are, it's probably time to look at charting programs.

Scott Beamer is on the Berkeley Macintosh Users Group's board of directors and has written hundreds of Mac programs over the past few years.

### The Bottom Line

For general charting use, DeltaGraph is the clear choice. But if you want more numbercrunching ability and aren't concerned about





8-bit color and 3-D charts, then KaleidaGraph is the best pick.

For high-end data analysis and expert technical charts, Igor is rapidly

becoming an underground favorite, but only for those who care more for the numbers than for the ability to fine-tune the chart's appearance.



Visual Business Systems No. 5 is the only stand-alone charting program for the Mac intended specifically for presentation graphics. Its inability to utilize Macintosh system fonts is a drawback, however.



## **BUYER'S GUIDE**

## MacUser

300 BEST NETWORK PRODUCTS

**Everything You Need** 

to Build Big, Fast,

**Painless Networks** 

Untangle your cables and sharpen your screwdriver, because this month, MacUser presents the complete guide to networking.

For starters, "How to Set Up the Perfect Network" looks at the big picture: the problems you may encounter and the solutions available.

Next, to help you choose basic network tools, MacUser's NetWorkShop tested 23 Ethernet transceivers for the Mac and 5 LocalTalk-to-Ethernet routers.

Turn to our directory for a list of more than 300 products for connecting Macs, PCs, UNIX workstations, and mainframes.

And don't forget our regular Bridges section. This month it looks at distributed file servers and TCP/IP networks.

Altogether, it's everything you need to stay well connected.

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# Our products with these we



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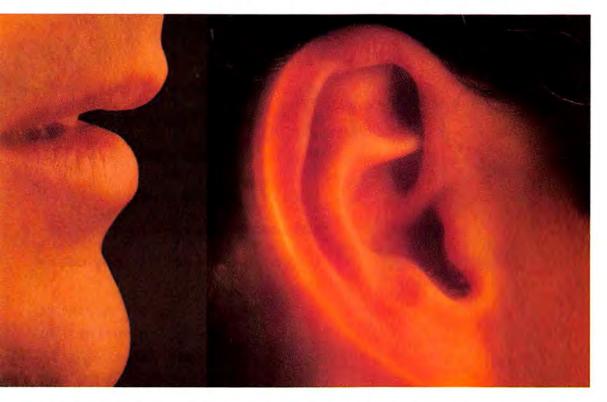
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## How to Set Up the Perfect NE



Lots of planning and a little education are the keys to a troublefree network — and happy users.

here's no way around it: Building a network is a big project. You can't link 1,000 Macs and PCs to the two Macs and the PostScript printer in your office just by adding PhoneNET connectors. The networking process is something like the old joke where a man carrying a violin asks, "How do you get to Carnegie

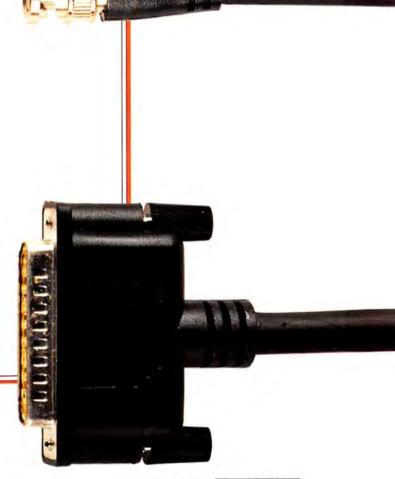


## WOR

Hall?" and he's told, "Practice, practice, practice!" So how do you get from a small network to a big one? Planning, planning, planning!

Like the violinist, you as the network designer must put in a lot of work. If you don't, you're likely to end up with a sluggish, inefficient network and users who find it's more convenient to run around with floppy disks than to use it. Your first tendency may be to blame a file server, a printer, or your electronic-mail software for your problems, but you won't necessarily solve them by replacing these items: You may need to go on and overhaul your network.

BY JOHN RIZZO



## NETWORKING

Whether you're creating a network from scratch, connecting a group of Macs to a larger DOS network, or hiring a consultant to do it all, you should begin by asking yourself the following questions:

How many users will I have in the beginning? In one year? In five years? Don't think small. Even if you're planning only within a department, you can design a small LAN (local-area network) that you can easily merge with other LANs later. If you're planning to grow beyond 15 nodes, you'll probably want to have a star hub and in-wall wiring.

Think modular. Subdivide the network into work groups separated by routers, thus cutting the network traffic down by restricting it to local groups.

What is the network being used for? Desktop publishing puts different strains on a network than a multiuser database does. Base work groups on the users' tasks as well as their location in the office.

What network resources do I want? Shared network resources, such as printers, mail servers, and file servers, should be spread throughout the network so that those who need them most can access them easily.

How stable will the organization be? If your organization is going to change a lot, you should consider using Macs as servers instead of investing in proprietary file-server hardware; you can always use a Mac as a workstation later if the group breaks up.

If users are going to frequently rearrange their cubicles, make sure the cabling setup is flexible. A product such as PhotoLink, which beams infrared network signals to workers in cubicles, is great for organizations in flux (see "Look, Ma — No Wires," April '90, page 278).



You can design a small LAN that you can easily merge with other LANs later.

## **Network Components**

The next step is to choose your hardware and software, a task sometimes complicated because of the ambiguity of networking terminology. Asking for "an Ethernet network" is like specifying only the foundation of a structure you want built and letting the contractor go to it you may get a gas station when

		Apple	Dayna	Farallon	Novell	3Com	TOPS
)	Cabling and cabling hardware						
2	LocalTalk board for PC	AppleTalk PC	DaynaTalk*				FlashCard
	Ethernet board for Mac	EtherTalk NB			Etherport	EtherLink	
	Token-ring board for Mac	TokenTalk NB					
	Cabling; connectors	LocalTalk	DaynaTalk*	PhoneNET			FlashTalk*
	Star hub		-	StarController			
	Rouler	AppleTalk Internet Router				GS/3	
	Gateway				Netware	CS/1	
	Services software						
	File serving	AppleShare	DaynaNET	Timbuktu	Netware	3+	TOPS
5	Electronic mail		DaynaMail		Netware	3+Mail	Inbox
	Print spooling	AppleShare Print Server	DaynaNET		Netware	3+	TOPS Spoo
	Services hardware						
	Server units	Macintosh			Netware	3S series	

\*DaynaTalk and FlashTalk are modified LocalTalk connectors with enhanced performance.

Table 1: These companies all produce the necessary components to build a LAN. You can stick with one company, or you can mix and match components from these or other vendors to take advantage of their particular expertise.

you wanted a Tudor cottage.

Network components belong to three categories: cabling and cabling hardware, services software, and services hardware. Although these categories interrelate, you should also consider them separately.

You can buy network components as you'd buy a stereo system, going with the same company name for every piece or using many different companies (see Table 1). It's often best to mix and match, both to meet your needs and to take advantage of a vendor's specialty. If a singlevendor solution suits you best, that's great - but don't assume that that factor will make network setup and administration any easier or that it will simplify your choices. You'll still have to know enough to specify which components you need.

## **Cabling and Cabling Hardware**

The most basic part of a network is the transceiver - the hardware that sends and receives network signals. The main choices are LocalTalk, Ethernet, and token ring, which differ from one another in cost as well as speed. Other less common options are LANSTAR and Arcnet. They can run AppleTalk protocols on top of their own low-level protocols because the Mac's transceiver hardware does not affect network software. LANs using different transceivers can communicate with each other using a device called a router.

LocalTalk is the least expensive



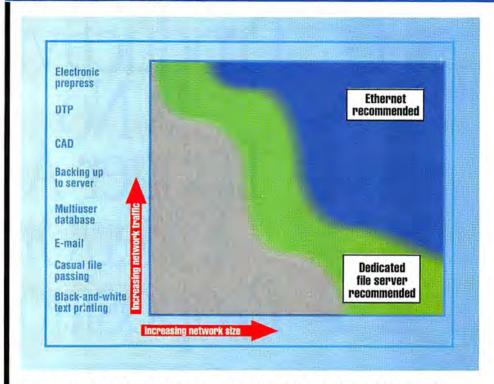


Figure 1: How do you know whether you need a dedicated or a distributed file server? When is Ethernet preferable to LocalTalk? The answers to both questions are found in the number of users on your network and the amount of data they're passing back and forth. A distributed file server will work fine if the number of users and the data load are relatively low. Similarly, Ethernet is not required if the most complicated task on the network is text printing, especially since printers do not have Ethernet connections.

transceiver, since it's built in to every Macintosh. LocalTalk cards from a variety of sources - including Apple, TOPS, and Daystar - are also available for PCs. However, LocalTalk is

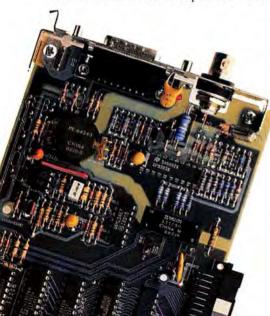
> The most basic part of a network is the transceiver the hardware that sends and receives network signals.

the slowest transceiver, generating signals at only 230.4 kilobits per second.

Ethernet, the fastest transceiver, is rated at 10 megabytes per second. These transceivers are widely available and come as add-in boards or external boxes that connect to the Mac's SCSI port.

Token ring, which runs at 4 megabits per second, is a common way to connect PCs to IBM mainframes. Token-ring cards for the Mac became available only last summer, when Apple introduced the Token-Talk card. Asante and H3 also produce token-ring cards for the Mac II.

If you want to replace LocalTalk with a faster transceiver, you need to consider the number of users on the network and what they're using it for





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## NETWORKING

(see Figure 1). LocalTalk gets bogged down when many users move megabytes of data across the network. Ethernet is a good candidate for electronic color prepress, 3-D CAD, and heavy multiuser database activity. Remember, however, that laser printers can use only LocalTalk, so Ethernet users require an Ethernet/LocalTalk router to get access to a printer (see Figure 2).

Choosing a transceiver does not lock you into a specific type of cable. Ethernet can run on either its original thick coaxial cabling, the newer thin coaxial cable, or the same twistedpair wiring that LocalTalk uses. Choosing a cabling scheme is mostly a matter of convenience, as the cabling itself has no impact on speed.

The first cable for Mac networks was Apple's twisted-pair cable, which still comes with LocalTalk connectors. It is OK for small LANs, but it's easier to use in-wall telephone wire for networks bigger than 15 nodes. In this type of situation, all wires run to a central location, usually the telephone closet. A connection board known as a punchdown block connects the incoming wires.

For high-end networks, Du Pont makes optical cabling for LocalTalk, Ethernet, and token ring. Because you still use the same transceivers as you do with electrical wiring, optical cabling won't make the network any faster. But because optical signals don't degrade as quickly as electrical signals do, you can cover longer distances. You also get better security - optical cabling prevents wiretapping and protects the network from electromagnetic interference from nearby motors, power supplies, electrical wiring, and other network cables.

## **Topologies**

The topology is the physical layout of the cable and network devices. Planning the topology before you install the hardware can prevent costly rewiring jobs later.

The simplest and cheapest setup is a bus topology, in which nodes are

### **Table 2: The Right Stuff** The pros and cons of various networking components Transceivers LocalTalk Free Too slow for data-heavy traffic. Ethernet Fastest. VAX connectivity. More expensive per node than LocalTalk Token ring Most constant speed. IBM Most expensive transceiver. mainframe connectivity Generally slower than Ethernet. Topology Cheap. Convenient for small LANs. Bus Limited size and distance. Star Convenient for use with in-wall Requires a star hub for every 12-30 users. phone cabling. Mainframe connectivity. Common in PC networks Ring Requires extra wiring for in-wall cabling schemes. Internet backbone Connects several internets Isolates network traffic. Convenient for reorganization File-server software Distributed Slows down workstation Inexpensive. when traffic is heavy. Dedicated Large volume. Handles heavy traffic well Requires server hardware. Server hardware Mac Easy to use. Usable as More expensive than a PC. a workstation PC Less expensive than a Mac. Harder to use than a Mac. Usable as a workstation Proprietary Sometimes offers integration Can't be used as a workstation. with complete systems.

connected in a line - the configuration is similar to the knotted rope you had to climb in gym class. An example of bus topology is a network consisting solely of Macs connected by Farallon PhoneNET. This type of setup is best for a small work group that doesn't plan to grow beyond 3,000 feet. A signal repeater can boost network signals farther, but the logistics become awkward if a bus network grows beyond one room.

In a star topology, the network cabling radiates from a central point, usually a telephone closet. An activestar topology uses a star hub, or concentrator, at the center to boost network signals. You can also have a passive-star configuration, which doesn't use a star hub, but this type of configuration isn't recommended because its signals tend to be weak. (For a review of the two star hubs available for LocalTalk, see "Star Wars," May '90, page 186.)

LocalTalk star hubs have 12 to 16 ports per hub, so you should plan to add more star hubs as the number of users grows. The optimum situation is to have enough hubs to let you have one user for each arm of the star. In the case of a problem, some starhub software can tell you only which port is the source of the trouble, so having multiple users on each port can make it much more difficult to troubleshoot.

Another topology rapidly gaining support is the ring layout, in which all network devices are arranged in a closed loop. Token ring is by far the most popular ring strategy, officially blessed by IBM and, more recently, Apple.

Token ring is inherently different from LocalTalk and Ethernet, in which more than one node can broadcast signals at the same time. When

## Take This Simple Network Test.

## 1. Which Network Doesn't Tie Up A Valuable Macintosh As A File Server?

☐ AppleShare ☐ TOPS ☐ DaynaNET

Hint: AppleShare® requires a dedicated

Macintosh® as a file server. DaynaNET™ runs on an inexpensive yet fast IBM® compatible 286 or 386 personal computer. Distributed networks such as TOPS® don't require a dedicated file server, but steal processing power from every Macintosh on the network.

## 2. Does A Real Network Need A Dedicated File Server Anyway?

☐ Yes ☐ No

Souther THE WED THE FRISH

Hint: A file server provides centralized storage and management of information and a basis for running multiuser applications. Dedicating the file server improves the network's performance, reliability, and security. Even small networks can benefit from a dedicated file server.

> 3. Which Network **Operating System** Is The Fastest?

> > □ AppleShare

|美国泰国西南部市山市///

☐ DaynaNET

TOPS

Hint: Both TOPS and AppleShare run on top of the Macintosh or MS-DOS® operating system. This slows them down. The Dayna NET operating system directly controls the file server, taking full advantage of all its speed and processing power.

## 4. Which Network Will You Never Outgrow?

☐ AppleShare ☐ DaynaNET ☐ TOPS

Hint: You soon outgrow a distributed network

such as TOPS. because its performance deteriorates as you add users. Adding to an AppleShare network requires addi-

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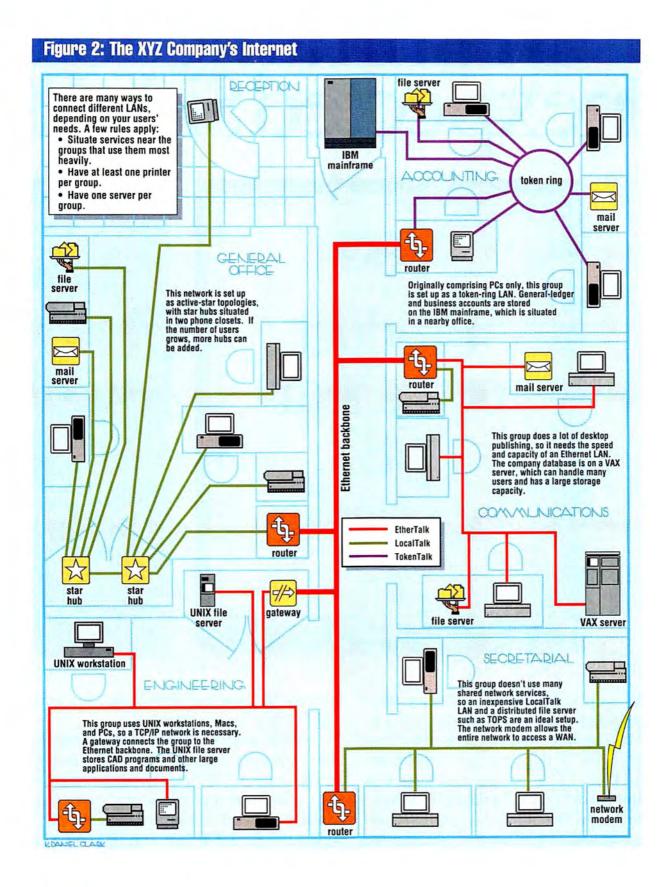
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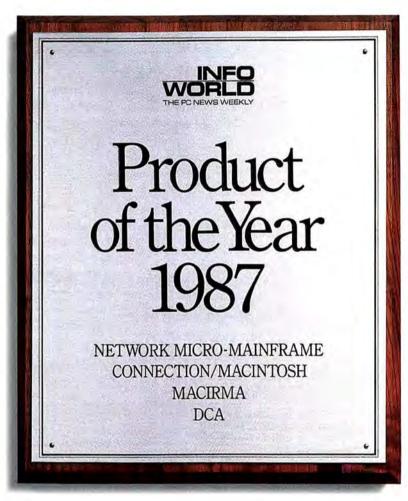
Answers:

as to networks running NetWate. Dayna VET. And for even more growth, Dayna VET networks can be connected together, as well Net Wate, 8 the leading high performance network system in use today. 4. You guessed it. for princing, and don't mind waiting. 3. DaynaNET In fact, DaynaNET is a unique version of I. DaynaNET. It's like getting a Macintosh free. 2. Yes. Unless you're using your network just

## NETWORKING



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Once a year, Macintosh™ users are asked to name the best Mac-to-mainframe product. And for the past three years, the name they chose was MacIRMA™ This has made us very happy.

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Solve your Macintosh networking equation:

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The GatorBox<sup>®</sup> is the most powerful Mac-to-Ethernet gateway you can buy. It connects your Macintosh networks to Ethernet quickly and easily. Macintosh users on both LocalTalk and Ethernet can share laser printers, electronic mail and valuable storage.

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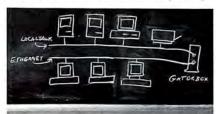
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## NETWORKING

traffic is heavy, the signals collide and have to be re-sent, slowing down the network. On a token-ring network, however, a node cannot transmit a signal until it receives a "token," a command that is passed from node to node.

Thus, token ring usually runs at the same data-transfer rate, regardless of the amount of activity or the number of extra nodes you add. If achieving constant network performance is a priority for you, token ring is a good solution.

Token ring is also a good way to connect to an IBM mainframe down the hall without having to resort to a modem, as token ring is part of IBM's SNA (systems network architecture) mainframe-network strategy. Unfortunately, you can't connect token ring to UNIX or minicomputer systems such as the DEC VAX.

## Internets — Beyond the LAN

Often, networks that start out as independently planned LANs end up as a set of connected work group networks called an internet (see Figure 2). Today, networks of Macs, PCs, VAX machines, UNIX workstations, mainframes, and even networks using completely different protocols can communicate like an electronic United Nations, It's also a common strategy to divide a larger network into smaller pieces in order to isolate network traffic.

On internets, LANs are connected by routers, bridges, and gateways terms that are often used incorrectly. The Haves InterBridge, for example, is not a bridge at all but a router (most Mac products that join networks are routers). Routers pass only data that is addressed to another network; data that is addressed within a network, such as a heavy-traffic desktop-publishing group, can't flood the rest of the internet. Half-routers, such as the Shiva NetModem, require users to manually connect their Macs to the AppleTalk network via modem (see the Labs Brief in this issue).



Token ring is also a good way to connect to an IBM mainframe down the hall without having to resort to a modem.

Routers can connect networks that are based on different transceivers. The AppleTalk Internet Router, for example, is software that runs in a

## **Network Glossary**



## AppleTalk:

Apple's set of specifications that describes network hardware and protocols. The specifications are modular, letting an assort-

ment of Mac and non-Mac devices communicate over a variety of transceivers and media. The specifications were upgraded in AppleTalk Phase 2, announced in June 1989, which removes some of the limitations of the original AppleTalk, referred to as Phase 1.

## bandwidth:

The maximum transmission rate of a transceiver.



## bridge:

A device that separates network traffic by keeping a list of nodes on each side of itself. It

retransmits a message from a node on one side only if it is destined for a node on the other side

## DECnet:

Digital Equipment Corp.'s set of network specifications for use with its minicomputers and workstations.

## EtherTalk:

The low-level protocol that allows transmission of AppleTalk data by use of Ethernet transceivers



## Ethernet:

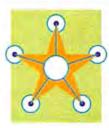
The transceiver and protocol that can generate network signals at 10

megabytes per second. Ethernet is defined in the IEEE 802.3 specification.

A computer/hard-disk-drive/software configuration that lets users on a network share files and applications on the hard disk.

## gateway:

A device that translates protocols between two types of networks such as one based on AppleTalk and one based on TCP/IP.



## hub:

A multiport repeater. A hub receives signals from a device on one port and retransmits them to devices on other ports. Also called concentrator.

Two or more networks joined by routers, bridges, or gateways.

## local-area network (LAN):

A group of connected computers and shared peripherals residing at a specific location.

## LocalTalk:

1: The low-level protocol that lets AppleTalk data be transmitted at 230.4K per second, using the Mac's built-in transceivers.

2: Apple's LocalTalk Cabling System.

3: Loosely defined, any transceiver or connector that implements LocalTalk protocols, including Apple's LocalTalk Card for the PC, Farallon's PhoneNET, and Du Pont's LAN One product



## Of course there are other ways to connect an IBM mainframe to Macintosh.

Being able to connect your Macintosh computers with an IBM mainframe is one thing. Being able to do it the way MacMainFrame does it is quite another.

The fact is, no other Macintosh-to-mainframe connectivity solution comes close to MacMainFrame for its ease-of-use.

With MacMainFrame, you can quickly and easily access your mainframe to get everything from e-mail to customer records.

You can transport hostbased information into applications such as Excel, Wingz and MacWrite for generating more powerful reports.

And thanks to Mac-MainFrame DFT, you can access as many as five different live sessions at once. You can even download mainframe information to your departmental printer with a simple keystroke.

But the best part of all is that you don't have to change the way you work with your Macintosh. From using standard conventions like the mouse or cutting and pasting, everything



## Ours just has more polish.

works exactly the same.

All of which really isn't surprising when you consider that no one has had more experience with Macintosh-to-mainframe connectivity than Avatar.

And because we specialize in Macintosh-to-main-frame connectivity, there's a version of MacMainFrame for every Macintosh from the Mac512Ke to the MacIIcx. Even one that lets you dial in from remote locations.

And they're all backed up by an unparalleled level of service, support and applications expertise.

Call 1-800-289-2526 for a free booklet that answers many of your questions about Mac-to-mainframe connectivity. Or write: Avatar Corporation, 65 South St., Hopkinton, MA 01748.

If you're looking for a connectivity solution that will let you get the most out of your Macintosh computers, it will really give you something to chew on.



## NETWORKING

Mac II that connects LocalTalk, Ethernet, and token-ring networks.

Bridges are similar to routers but are Ethernet-to-Ethernet devices with lesser capabilities and accuracy. True bridges don't exist in Mac networks at this time, mainly because there has been no need for them.

A common internet topology is the backbone, a line of routers that connect to various LANs or to host minicomputers (see Figure 2). This modular internet layout keeps problems isolated, and you can easily modify or expand it. It's possible to set up an all-LocalTalk internet, but a backbone of Ethernet is faster.

Gateways connect totally dissimilar networks, such as those based on AppleTalk, TCP/IP (acommon UNIX network), or SNA, by translating between foreign protocols. Gateways also can connect a LAN to a WAN (wide-area network). WAN standards, such as X.25 and X.400, can connect intercontinental networks through such media as satellites.

## **Network Services**

So far, I've discussed the lowlevel signal-producing and -carrying equipment. Shared services, which are a network's raison d'être, are equally important to consider. The basics—file serving, electronic mail, and print spooling—come in a variety of types, with different features and interfaces. Other services include network modems and automatic backup.

Network-service software can be purchased separately or integrated into a big package, often called a network-operating system in the DOS world.

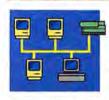
A file server is a volume that is accessible to multiple users on a network. It can be a central repository for data, a method for passing files over the network, or the location for a multiuser database.

Before you consider contacting file-server companies, you should be aware that there are two distinct types of file servers: distributed and dedicated. Distributed file servers let users share parts of each other's hard disks over the network. Their main benefit is that they're inexpensive, because you don't need to buy file-server hardware. TOPS, Personal Server Network from IPT, and the newly released DataClub from International Business Systems are distributed file-serving systems. If you can wait for the vapor to solidify, Apple will have its own distributed file-serving system called Mac FileShare as part of System 7.

A distributed file server can work well for small LANs and work groups, but you may find yourself moving to a dedicated server when a lot of users join the network. If someone accesses your hard disk while you're working on it, your Mac will take a performance hit. Consequently, the more people accessing your hard disk, the slower your Mac becomes.

You can solve this problem by moving the shared volume from your hard disk to an independent disk

## Network Glossary, continued



## network:

1: A group of computers and shared peripherals connected in a continuous cabling system. In an AppleTalk internet, the bounda-

ries of networks are defined by routers and gateways.

2: Generic term describing any group of connected computers.

## node:

Any device that has an address on a network, such as a workstation, printer, or file server. (Devices such as modems and star hubs are usually not nodes.)

## protocols:

A set of rules governing the exchange of information over a network. The rules describe the content, format, timing, and error control of messages. Low-level protocols define things such as transmission rates, data-encoding schemes, physical interfaces, the method by which nodes contend for the chance to transmit data over the network, and network-addressing schemes. High-level protocols define user-oriented functions such as printing and print spooling, file sharing, and the association of Chooser names with printers, servers, and other shared network devices.



## repeater:

A device used to amplify network signals in order to extend a network's maximum cable length.

## router

A device that connects two or more networks. Unlike bridges, routers intelligently decide the most efficient route for data going from one network to another. Different vendors' Apple-Talk routers can interconnect various combinations of LocalTalk, EtherTalk, and TokenTalk networks.



## services:

Shared network resources—such as file sharing, print spooling, and E-mail—available to all users.

## TCP/IP:

The transmission control protocol/internet protocol, a set of network specifications used in UNIX networking.

## TokenTalk:

The low-level protocol that lets AppleTalk data be transmitted by use of token-ring hardware.



## token ring:

A ring of devices that pass a sequence of bits called the token from node to node to determine which device can transmit data on a network.

## topology:

The physical layout of a network.

## transceiver

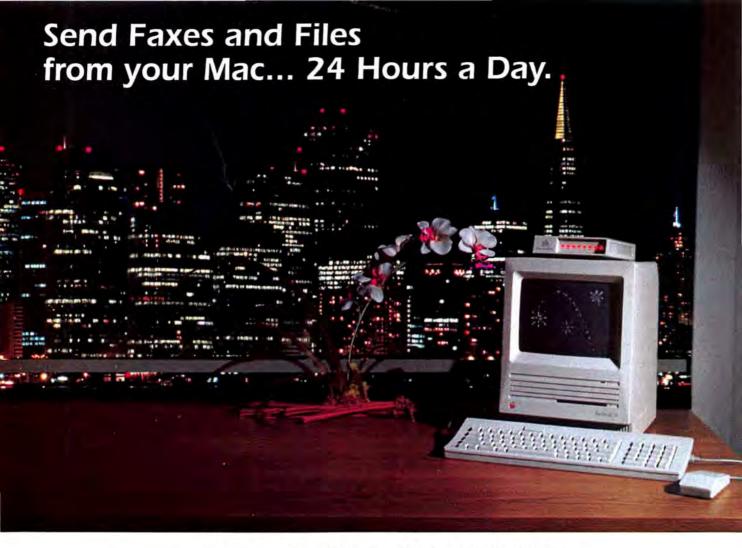
Hardware that sends and receives network signals. All Macintoshes have built-in Local-Talk transceivers.



## wide-area network (WAN):

A group of computer networks connected over long distances, often using telephone lines and satellite transmission.

— John Rizzo



## Introducing OrchidFAX

OrchidFAX™ is the networkable 9600 bps fax and 9600 bps data modem for the Macintosh computer. Now you can fax or send files direct from your Mac — 24 hours a day. OrchidFAX comes equipped with everything you'll need to get started, including an extended version of BackFAX, the premier fax processing software.

Unattended Fax and File Transmissions. Send and receive faxes to Group 3 fax machines worldwide in the background with or without MultiFinder™ at 9600 bps. To another Macintosh equipped with a compatible fax modem, send the file instead. It's the easiest way to send an error-corrected Macintosh file, and you don't even have to be there.

Network the Modem on an E-mail System. If your company is using CE Software's QuickMail™ or Microsoft® Mail, you can connect the OrchidFAX to the mail server so that the modem can be used by anyone on the network.\* Everyone can then send faxes and files in the background from their workstations.

Standard 2400 bps Data Modem. Your OrchidFAX is also a standard Hayes AT-command compatible data modem. It adheres to all Bell and CCITT standards, letting you exchange information with the millions of modems worldwide at 2400 bps and lower speeds.

9600 bps Data Modem Capabilities. To other OrchidFAX and AppleFax™ modems, connect at 9600 bps in data mode. Your error-corrected data is transmitted up to three times faster than standard 2400 bps modems.

Is OrchidFAX right for you? It is if all the documents you now send as faxes are created on your Mac. Or if you've ever needed to exchange files with another Mac user. Or if you're now using a standard data modem, and using a fax service for all your fax needs.

We've got a complete checklist to help you decide whether or not faxing from your Mac is right for you. To find out more, call or write us, and we'll send you a comprehensive brochure to help you understand the advantages of faxing direct from your Mac. Or see your nearest OrchidFAX dealer for a demonstration.

\*Additional software from Solutions, Inc. is required.

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## NETWORKING

attached to the piece of hardware that runs the server software, the dedicated file server. Server software includes AppleShare for the Mac, Miramar's MacLAN Connect, DaynaTalk for the PC by Dayna Communications, 3Com's 3+ and Novell's Netware for the PC or dedicated file server, and UShare for UNIX workstations.

Since users view networks through server software, the subject of interface shouldn't be ignored. The most user-friendly type of file-serving interface, the AFP-compliant interface is the one originally used in AppleShare. AFP (AppleTalk Filing Protocol) is Apple's standard protocol for file serving.

Although there is no standard AFP-compliant file-server interface, the AppleShare interface is becoming the de facto standard: Personal Server Network and DataClub, for example, use this interface. TOPS and 3Com, which produce AFP-compliant servers, use their own interfaces.

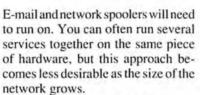
There is also no standard interface for E-mail. Each E-mail package has its own features and method of presenting them. Though these features can be tantalizing, it's important to look beyond the features lists and pay attention to the mail architectures to see which one best suits your situation: Some are more expandable than others, whereas others are faster for smaller networks.

Print serving on a PC LAN allows users to share printers — an ability Mac users already have. AppleTalk networks also have the advantages of network spoolers, which queue printing jobs and prevent your Mac from locking up while you wait for other jobs to print. A print server also transfers the computational load from your Mac to the print server, keeps track of what has been printed and by whom, and is helpful for troubleshooting when a printer is stuck on someone's 4-megabyte printing job.

## Server Hardware

As with dedicated file servers, you must consider the hardware that

Sometimes
multiuser databases outgrow
Mac-based file
servers as well
as dedicated
hardware.



A server platform can be a Mac, a PC, a UNIX workstation, or a box designed to act solely as a file server. Choose your server hardware carefully, as it can be as responsible for network speed (or lack of it) as the type of transceiver you use. Macs and PCs make good file servers if you use the fastest unit you can afford (don't use an old Mac Plus or PC XT if you're concerned at all about network performance).

Using Macintoshes and PCs as servers is a flexible solution for facilities managers, because they can be recycled as workstations to perform basic tasks when they are no longer useful as servers. Otherwise, when you need to replace your old dedicated server with a newer and faster model, you're stuck with old server hardware you can't use for anything else.

You often get better performance if you use several servers spread out over the network rather than concentrating everything on a single leviathan server. As you do with printers, you should locate servers in the work groups that use them. It will severely affect performance if users have to cross one or more routers to get to a mail or file server.



Sometimes multiuser databases outgrow Mac-based file servers as well as dedicated hardware. Many networks have had to move their databases to a host computer such as a DEC VAX to keep up with storage requirements and user access. If you foresee a very large database in your future, it's a good idea to consider using such a host from the beginning rather than having to restructure your network later.

## Plan, Plan, Plan

This brief overview has provided some tips on network design, but there are many other details involved in designing a network. You can get some specifics in the articles on Ethernet hardware and multiuser databases in this issue.

Remember to scope out the forest before you look at the trees: You need to calculate how many users will be on your network over the next few years and what kind of work they plan to be doing.

You'll have the greatest success if you get involved with the network planning, regardless of whether you hire a consultant to set it up or do it all in-house. Even in the point-and-click world of the Mac, networking is still not as easy as it should be, could be, and will be in the future.

John Rizzo is *MacUser's* technical editor. He frequently writes about connectivity and technology.

## ARE YOU READY FOR

## ETHERNET?

Ethernet can be the answer to your slow-network blues, or it can be an expensive disappointment.

MacUser NetWork-Shop tells you why —and what to buy.



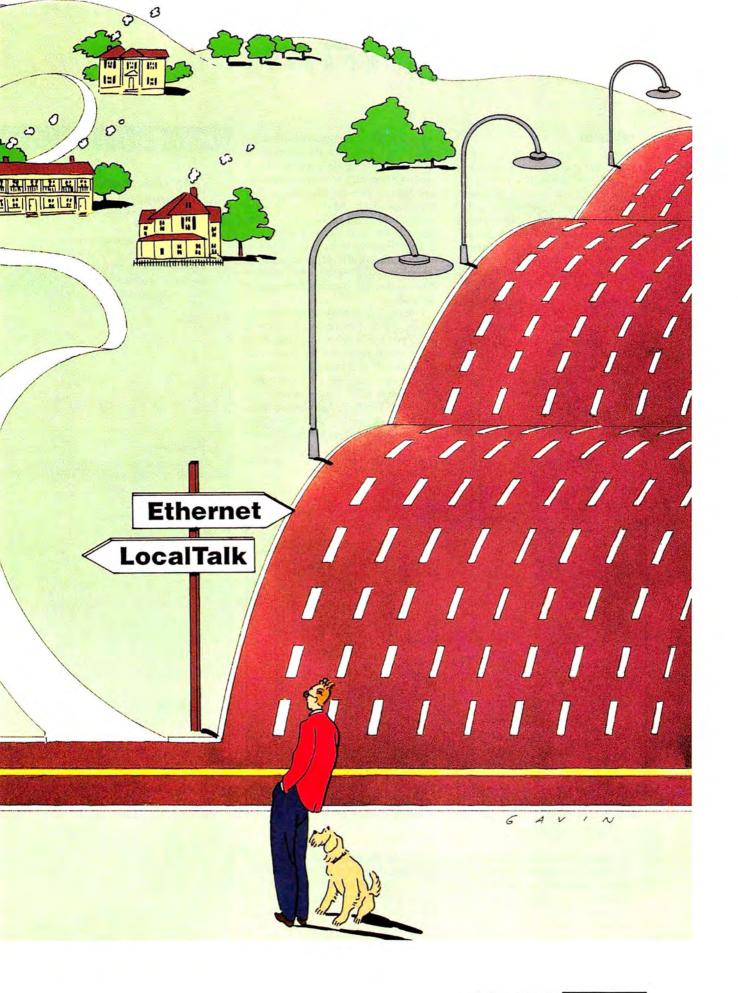
BY
DIMITRI ZARBOULAS,
PHILIP ZARBOULAS,
AND THE MACUSER
NETWORKSHOP
STAFF



hen the first Mac rolled out of Cupertino back in 1984, users-to-be were seduced by its civilized approach to personal computing. Though the Mac's elegant interface stole the headlines, a less heralded feature — a built-in network hookup — was equally revolutionary. As manufacturers began to take advantage of this LocalTalk connection, the isolated desktop-computer user gradually

evolved into a member of a file-swapping, printer-sharing, electronic-mail-sending community.

LocalTalk is convenient, but today's 24-bit color, sound, and animation applications create files so enormous that LocalTalk just can't keep up — especially on large, heavily used networks. Desktop publishers, multimedia designers, database specialists — anyone who moves large amounts of information — find themselves drumming their fingers on their desktops, waiting while LocalTalk strangles on large file transfers. A faster network is needed — and, luckily, it's here. This month, MacUser NetWork-Shop slips into network overdrive to test interface cards and SCSI adapters that link your Mac to the high-speed world of Ethernet.



## **Net Needs**

Today's top-of-the-line IIfx is barely recognizable as a descendant of the original Mac. But despite all the improvements over the years - hard-disk drives, more RAM, faster microprocessors, SCSI - the Mac's built-in LocalTalk network scheme remains essentially unchanged. For most users, this consistency is a blessing. Macs of all vintages can easily and inexpensively share printers and file servers. LocalTalk fulfills Apple's original goal of making small-group networking available to every Mac user.

But as networks grow in size and carry more traffic, the Mac's built-in LocalTalk transceiver (network hardware) begins to show the strain. Because only one Mac can use a network at any one time (see the "How It Works" sidebar), the more nodes (Macs, printers, file servers) that are trying to access your network, the longer you'll wait for your turn. Because bigger files take longer to transfer, this choking increases with file size.

LocalTalk and its governing specifications, AppleTalk (see the glossary in "How to Set Up the Perfect Network" in this buyer's guide), have another limitation that may be more important to your workplace than speed: They're used mostly in Mac-only networks. As more Macs appear in business, government, and universities, users need access to information stored in minicomputers or PC networks. A connectivity solution (Mac-to-non-Mac communication) must be found.

Ethernet, a tried and true network technology, is one popular solution to both problems. Using Ethernet, hundreds of nodes can happily chat at speeds well above that of LocalTalk. Also, Ethernet's performance degrades far more gradually than LocalTalk's as more nodes are added (see Figure 1). And since its introduction in the early '70s, Ethernet has become the network technology of choice for Digital Equipment's VAX line of business minicomputers as well as in

## **How It Works**

## Successful transmission

An Ethernet network can successfully carry only one message at a time. The originating node must first check to see if the network is busy (sensing for carrier). When all is clear, the node broadcasts its message and simultaneously reads it back from the cable to verify that it is not being garbled by noise or a collision.

## Collision

A message takes one millionth of a second to travel the maximum allowable length of a thin coaxial Ethernet cable - plenty of time for another node to initiate a message before realizing that the first message is on its way. When two or more nodes attempt to broadcast a message during the same millionth of a second, the result is a collision.

## **Jamming**

When messages collide, the network is unusable until every node stops transmitting. Messages that collide are garbled and need to be re-sent, slowing down network throughput. The more traffic on a network, the more collisions occur and the more network performance degrades.

## Figure 1: Ethernet versus LocalTalk

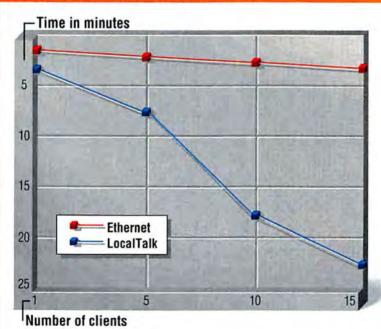
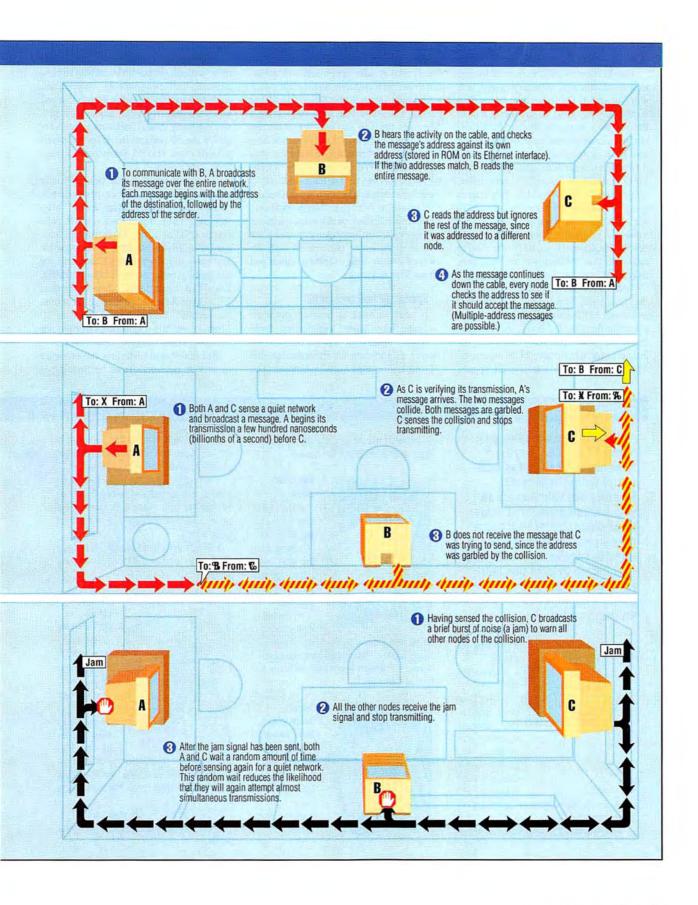


Figure 1: All networks slow down as more devices compete for attention. We added nodes to an Ethernet and a LocalTalk network and charted how network performance eroded. When we had 15 Macs on each network, our Ethernet-equipped server took less than 3.5 minutes to download a 2-megabyte file to each node. LocalTalk struggled for nearly 25 minutes before finishing the same chore.



universities and government agencies on different UNIX-based systems.

Mac Ethernet interfaces once belonged to a niche market, were expensive, and were intended for those few users who would pay anything to get them. But in the past two years, the demand for Ethernet has increased, the number of vendors has proliferated, and costs have come down. Most interfaces now cost around \$600 or \$700 — LocalTalk, remember, comes free with every Mac. Ethernet is quickly entering the mainstream of Mac networking. If your growing LocalTalk network is choking on 20-megabyte Adobe Photoshop files, or if you need to talk with that VAX down the hall, now may be the time to switch to Ethernet.

To help you decide your best route into the fast lane, MacUser NetWorkShop evaluated 23 Ethernet interfaces: 9 NuBus cards for the Mac II family, 5 cards each for the SE/30 and SE, and 4 external SCSI adapters for use on any SCSI-equipped Mac from the Plus to the IIfx. We spent a month swapping cards in and out of the NetWorkShop's two dozen Macs. We noted file-transfer speed and multiuserdatabase performance, testing interfaces alternately on an AppleShare file server and on the client (the Mac requesting a file from the file server). We crammed our test network full of traffic to see how Ethernet's performance compared with LocalTalk's. We looked at the importance of having a fast hard-disk drive. Finally, we wrote a test utility, NetBasher! (exclusive to MacUser NetWorkShop), to test raw interface performance without other network influences and bottlenecks. We identified star performers and answered some long-standing questions about Mac networks.

## Speed: Greed or Need?

If your network is frustratingly slow — especially when transferring large graphics, sound, or animation files — you're a candidate for Ethernet (see the "Troubleshooting Guide" sidebar). If you

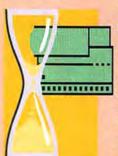
need evidence more concrete than a gut feeling that you're spending too much time watching the little wristwatch, a network-traffic-monitoring application such as Farallon's TrafficWatch can tell you how heavily your LocalTalk network is being used. If network use hovers above the 30 percent mark for extended periods, you should investigate a performance upgrade.

Using Ethernet is just one of many ways to improve network performance (see "Making a Small Net Work," May '89, page 151). But even if you use your fastest CPU as a file server, the quickest hard-disk drives available, and a network layout (or topology) that's been perfectly designed to reduce cross-network traffic, LocalTalk can't transfer data faster than 230.4 kbps (kilobits, or thousands of bits, per second). Ethernet's top speed of 10 Mbps (megabits, or millions of bits, per second) is more than 40 times faster.

But real-world restraints can conspire to prevent networks from performing at

## **Troubleshooting Guide**

Will Ethernet speed up your network? Not necessarily! It depends on what kind of work you're doing. In general, Ethernet will help if users on your network regularly transfer large files (greater than half a megabyte). Other LocalTalk troubles require other solutions — but keep in mind that there are few hard-and-fast rules. Network optimization is more art than science.



## Printing is slow.

Ethernet won't help.

 Add one more printer. Use routers to subdivide your internet into smaller workgroup-based networks. Put

users on the same network as the printer they normally use.

Add a network print spooler. The Apple-

Share print server can run on the same Mac as an AppleShare file server.



## Mail is slow.

Ethernet
won't make a
big difference
—unless you
are attaching
large files to
your mail
messages.

 Subdivide your in-

ternet into smaller work-group networks, using routers. Put a mail server onto each network. Put each user's mailbox in his or her own network.



## File transfers are slow.

Ethernet should help, but tuning yournetwork may also solve the problem.

- If you transfer large files, Ethernet is for you. If you do upgrade to Ethernet, get a faster hard-disk drive for your server.
- If most files are small, subdivide your internet with routers and place a file server on each network. Place each user on the same network as the server he or she uses most often.
- If you can't afford to subdivide and add servers, get a faster CPU for your existing server.



## Multiuserdatabase access is slow.

So what else is new? • The bottleneck is probably your database applica-

tion, not your network. Furthermore, most database access comprises very small data transfers. Ethernet probably won't help

- · Get a faster CPU for your server.
- Get a faster hard-disk drive for your server.

their theoretical limits. Our testing showed that Ethernet provided at most a 5:1 performance increase over LocalTalk for most common networking functions. Although a 500-percent performance gain is certainly nothing to sneeze at, it does show that theoretical limits are just that -theoretical. Many factors contribute to this gap between the ideal and the real. but our testing showed that the most important constraint on file-server performance is the speed of its hard-disk drive. Network overhead is another limiting factor, as is CPU speed (for the Plus and SE) and data collisions (see the "How It Works" sidebar).

Compared with LocalTalk, Ethernet can carry more data from more devices before performance degrades. We used Network General's Sniffer, a \$17,500 network analyzer, to increase the amount of traffic on our Ethernet network while we transferred files between Macs — no problem. LocalTalk, however, quickly bogged down as we added more traffic.



## Your network has too many users.

Tuning your internet topology may help you solve your problem.

- Subdivide your internet with routers.
- Put people who communicate with

each other most often into the same network. Try to keep fewer than 20 Macs in each work group. Place a printer, a print spooler, a mail server, and a file server in each network.

- If users in a work group do a lot of large file transfers, put that work group on Ethernet.
- If you have a lot of cross-network traffic or several networks, install an Ethernet backbone. (Your routers must then be EtherTalk-to-Local-Talk routers.)
- Avoid transferring large files across routers. If your network has a lot of users and they all transfer large files frequently, you may be better off with one large Ethernet network.
- Avoid placing users across a router from a file server or printer that they use regularly.
   With mail servers, have users in the same network as the server where they are registered.
  - Henry Bortman

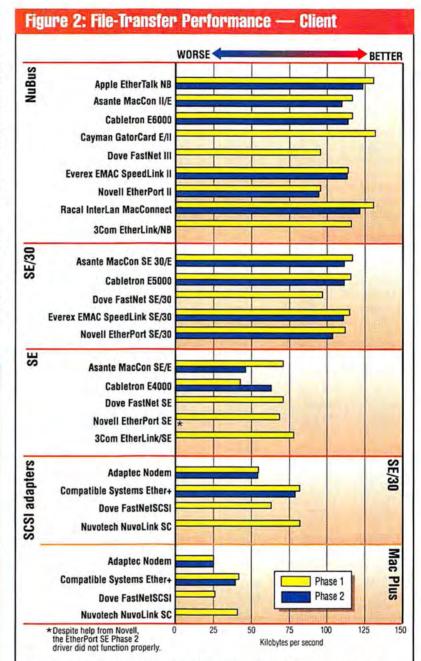


Figure 2: Ethernet is most useful for transferring large files between a file server and its *clients* (Macs requesting files from the file server). To test each interface's performance in a client, we installed the cards in their matching Macs and attached the SCSI adapters first to an SE/30 and then to a slowpoke Plus. We downloaded a 2-megabyte file from the server and clocked the transfer rate. We used EtherTalk Phase 1 drivers with all interfaces and Phase 2 drivers if they came shipped with the interface. CPU speed had the most overall influence, but clear leaders — and losers — emerged in each category.

In addition to increased speed, Ethernet gives access to worlds inaccessible to LocalTalk. If you communicate with an Ethernet-equipped minicomputer, mainframe, or network, you have two choices: upgrade your entire network from Local-Talk to Ethernet or connect your Local-Talk network to the Ethernet system with a router (see "EtherTalk-to-LocalTalk Routers" in this buyer's guide). If you go the all-Ethernet route, you'll still need a router to use your LaserWriter, because there's currently no way for a Laser-Writer (which has only a LocalTalk transceiver) to connect directly to an Ethernet network.

## **Getting It Together**

Ethernet interfaces come in two flavors: cards that plug into a slot inside the Mac and external adapters that plug into the Mac's SCSI port. If you have a Mac II, installation is no problem: Just open your Mac, and pop the card into any

available NuBus slot. SEs and SE/30s have internal PDS (processor direct slot) connectors for the card and a bracket ready for the second, smaller card that contains the Ethernet port. Installation, however, is no piece of cake on an SE or SE/30. You must carefully open the Mac with a special tool before the PDS and bracket are accessible, and you must carefully ground yourself to avoid frying the Mac's motherboard. Dangerous voltages lurk within the power supply, plus you void Apple's recently extended oneyear warranty if you open the case yourself. In short, get your dealer to do the installation.

If your SE or SE/30's PDS is already filled with a video card, accelerator, or other card, you can still connect to Ethernet, using a SCSI adapter — an external box that you plug into the Mac's SCSI port with a standard SCSI cable. And until someone ships an Ethernet interface for the Mac Portable's PDS or for the

PDS-less Mac Plus, a SCSI adapter is the only possible Ethernet interface for either.

A SCSI Ethernet device must share the SCSI bus with other devices such as hard-disk drives. Because the Mac's SCSI bus is slower than either the NuBus or PDS and because SCSI gives priority to disk-access commands, SCSI Ethernet performance pays a penalty. This slowdown is especially noticeable with file transfers in which the hard-disk drive is being heavily worked at the same time as the Ethernet interface. If you're after brute performance, our tests show that SCSI adapters are not your best choice (see Figure 2).

But don't dismiss SCSI adapters entirely. They're conveniently transportable among machines and easy to install. All four SCSI adapters have easily accessible switches for setting the SCSI identification number. The Adaptec Nodem is the most versatile, with two 50-pin

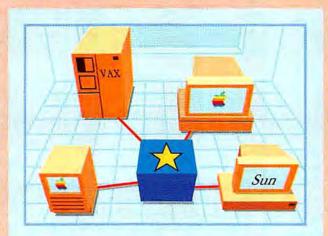
## T for Tu?

You've spent thousands of dollars wiring your building with twisted-pair phone wire so you could install a large LocalTalk internet. Now you want to upgrade to Ethernet, but you don't want to rewire with coaxial cable. You've heard that some twisted-pair Ethernet implementations are

available, but you don't want to install something that isn't an accepted standard.

Enter 10BASE-T, the about-to-be-adopted Ethernet twisted-pair standard from IEEE (the Institute of Electrical and Electronic Engineers). For several years, the IEEE folks - after agreeing on 10BASE-5 for thick coaxial cable (thicknet) and 10BASE-2 for thin coaxial (thinnet, or "cheapernet") have been arguing over 10BASE-T. The haggling is finally dying down, and a 10BASE-T definition has won preliminary approval. Expect many interface manufacturers to implement it before the year is up.

10BASE-T uses an active-star topology and runs over twisted-pair phone wire. A 10BASE-T wire run (the distance allowed between a node and the star hub) is limited to 100 meters (10BASE-5 supports 500-meter runs; 10BASE-2 handles 200). The star topology makes 10BASE-T wiring easier to modify than its coaxial cousins, however, because the star hub (concentrator) resides at a central location. Each Mac



With 10BASE-T Ethernet, Macs and other computers are connected to a star hub with twisted-pair wiring.

must have either an Ethernet interface with a 10BASE-T transceiver built in (Cabletron, InterLan, Asante, and Adaptec offer these for the Mac) or a built-in AUI (Attachment Unit Interface) port connected to a separate external 10BASE-T transceiver.

Some vendors, such as Synoptics, chose not to wait until the 10BASE-T standard was settled and established their own standard, called LattisNet. Synoptics'

> LattisNet hubs and transceivers have been on the Mac market for some time. Novell also offers a line of Ethernet interfaces for the Mac that have LattisNet transceivers built in. Unfortunately, there is only limited compatibility between LattisNet and 10BASE-T products. In addition to its LattisNet products, Synoptics sells a 10BASE-T transceiver that can attach to any Ethernet interface that has an AUI port (most do). Synoptics also offers two 10BASE-T hubs. Synoptics Communications, Inc., 501 E. Middlefield Road, Mountain View, CA 94043-4015;

(415) 960-1100.

Cabletron began shipping 10BASE-T Ethernet cards in February 1990. It also SCSI ports and an external terminator plug that lets you place the Nodem anywhere on the SCSI chain.

The Compatible Systems Ether+ and Nuvotech NuvoLink SC are internally terminated and have just one 25-pin SCSI port, so you must place them at the end of the chain — a real problem if you already have an internally terminated SCSI device. That the Ether+ and NuvoLink SC should share these and other features is not surprising, because Compatible Systems manufactures the hardware contained in both. The internally terminated Dove FastNetSCSI has one of the most unusual SCSI-connection schemes we've ever seen: An 18-inch cable sticks out of the back, with a 25-pin plug on the end to connect to the Mac. A 25-pin port receives a SCSI cable from the next device in the chain.

Before you install an Ethernet NuBus card in your Mac II, you should first set it to work with the type of cabling you plan

sells Ethernet hubs, which it calls Multi Media Access Centers (MMACs). In addition, Cabletron sells external 10BASE-T transceivers (called TPT-Ts), which can connect to an AUI port on an Ethernet interface. Cabletron Systems, 35 Industrial Way, Rochester, NH 03867; (603) 332-9400.

DAVID Systems has several 10BASE-T products. Its 10BASE-T DAVID Express-Net Hubs, which began shipping last December, come in three versions that accommodate 12 to 132 ports. For those with smaller budgets, DAVID's VolksNet 10BASE-T hubs (6 to 48 ports) are available at a lower cost per port, but they offer fewer network-management capabilities. DAVID's AUI-to-twisted-pair transceivers are called TP-MAUs. DAVID Systems, 701 Evelyn Ave., Sunnyvale, CA 94086; (408) 720-8000.

Farallon began shipping its 12-port StarController EN hubs and StarConnector EN transceivers (which connect to any AUI interface) in May. The StarController EN lets network managers manage Farallon's LocalTalk and EtherTalk StarControllers with the same StarCommand software. Farallon Computing, 2000 Powell St., Suite 600, Emeryville, CA 94608; (415) 596-9100.

- Henry Bortman

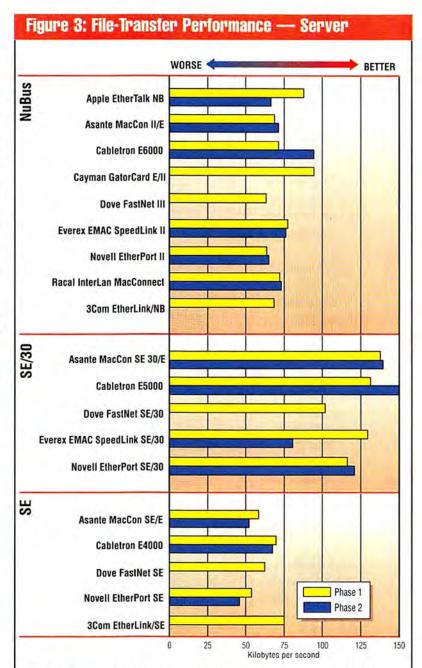


Figure 3: We used the same setup as that described in Figure 2 to test how fast each interface could perform in an AppleShare file server. (Apple advises against using SCSI adapters on a server, so SCSI adapters sat out this test.) We transferred 2-megabyte files to three client Macs (each containing an Apple EtherTalk NB interface) and clocked the transfer rate. The SE/30 cards trounced the NuBus cards, even though the Ilcx test platform has the same CPU as the SE/30. Two SE/30 cards were overall champs: the Asante MacCon SE 30/E when running EtherTalk Phase 1 and the Cabletron E5000 with Phase 2.

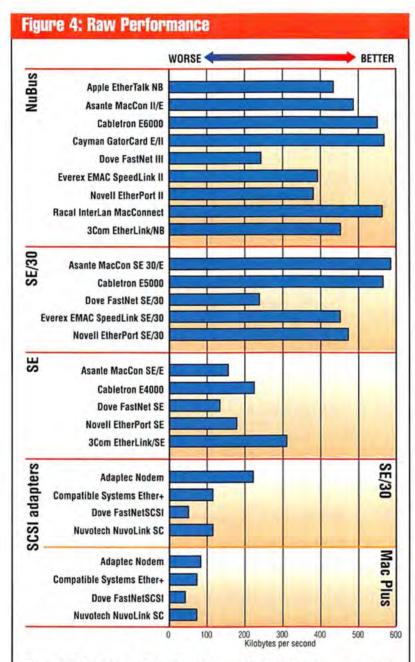


Figure 4: In the future, elimination of current Mac bottlenecks may uncover Ethernet interface power not usable in today's networks. We used a \$17,500 network analyzer to determine each interface's maximum data-transfer rate. The Asante MacCon SE 30/E edged out some heated competition from Racal InterLan, Cayman, and Cabletron's products. All Dove products were left far behind.

to use (for a discussion of Ethernet cabling options, see the "T for Tu?" sidebar and "How to Set Up the Perfect Network" in this buyer's guide). All NuBus cards require you to install jumpers, tiny pins and plugs that fit into and over equally tiny sockets and pins. Cabletron's E6000 requires several jumpers, and its confusing manual forced a call to the company's tech-support hot line. And although we didn't officially judge quality of construction, we couldn't help but notice more than two dozen wires hand-soldered to the E6000's circuit board. But the card was a top performer, so maybe these last-minute changes are its secret.

All the SE/30 and SE cards except 3Com's have external cable-selection switches (cracking open an SE case to make the change would be a major hassle). 3Com makes the switch in software. The NuvoLink SC and Ether+ SCSI-adapter boxes must be opened to get at their cable-switching jumpers, and the Fast-NetSCSI requires an optional transceiver (\$100) to connect to thick coaxial cable. The Nodem can't switch between cable types; you buy the model that works with your cabling scheme.

## Drivers' Ed

After you've popped the card into its slot or plugged in the SCSI adapter, you must install driver software. Ethernet driver software — known as EtherTalk — replaces part of the AppleTalk protocol to let the Mac communicate over Ethernet cabling while obeying AppleTalk's rules. Because interface manufacturers use similar hardware, driver-software quality is an important factor in interface performance. Our tests showed this to be true.

Apple recently enhanced its networking protocol with the release of AppleTalk Phase 2, which includes EtherTalk 2.0 (see the "Phase 2: New and Improved AppleTalk" sidebar in "EtherTalk-to-LocalTalk Routers" in this buyer's guide). Phase 2 supports a theoretical 16 million devices on a single Ethernet cable segment, as opposed to the old 254-device limit - a necessary increase as larger networks become the norm. But not all Ethernet cards come with Phase 2 drivers (see Table 1), although we expect the delinquent vendors to have Phase 2 drivers available within the next few months. Phase 2 also allows the assignment of different network numbers and zones (network device groupings) on a single

segment of cable. so we tested different configurations to see if the interfaces would function properly, find each other, and communicate. They all did.

All vendors use Apple's System Installer to install their Ether-Talk drivers into the System file and to copy other necessary files into the System

Folder. Once you've installed the drivers, you switch between LocalTalk and EtherTalk by clicking on an icon in the Network cdev. When we switched

**NetResult: The Best File Server** 

Even the fastest Ethernet interface is wasted without the right server hardware. For

the ultimate in file-server performance, MacUser NetWorkShop recommends a dualfloppy Apple SE/30 (\$3,869) with an FWB hammer300FMF 300-megabyte hard-disk drive (\$4,395). If you're running EtherTalk Phase 1, install the Asante MacCon SE 30/E (\$595); for Phase 2, use the Cabletron E5000 (\$699). Either lightning-fast combination will make the most of your Ethernet investment. FWB, Inc., 2040 Polk St., Suite 215, San Francisco, CA 94109; (415) 474-8055.

- Henry Bortman

MacUser



between LocalTalk, EtherTalk 1.0 (Phase 1), and EtherTalk 2.0 drivers, however, our SEs and Pluses sometimes crashed. We discovered that when we started up

an SE or Plus with LocalTalk drivers active, it didn't allocate enough room in memory for a switch to the memoryhungry Phase 2 driver. Luckily, in the

### Table 1: Features of Ethernet Interfaces NuBus NuBus NuBus NuBus Apple EtherTalk NB Asante MacCon II/E Cabletron Cayman GatorCard E/II F6000 **\$\$\$**\$ \*\*\* Mouse rating \*\*\* \*\*\*\* List price \$699 5699 \$595 \$595 One of the best performers. Difficult to Tied for fastest NuBus card. No Phase 2 Comments Pricey, but an excellent Good performance, competitive price. Skimpy manual, not for novices. performer in real-world tests, 3Com hardware. switch cable types. Fiber-optics option. driver at press time. Good raw performance Racal InterLan hardware. Cable support\* Thick coaxial included included included included Thin coaxial included included included included Twisted pair<sup>1</sup> MacCon II/ET (\$645) E6020 (\$699) nn no E6030SNA/40ST (\$899) Optical fibers no по Hardware Manufacturer (OEM) 3Com/Apple Racal InterLan proprietary proprietary National Semiconductor National Semiconductor National Semiconductor National Semiconductor Chip set Data-bus width (bits) 16 bits 32 bits 16 bits 32 bits On-board RAM (bytes) 64K 16K (64K option, \$50) 16K (64K option, \$50) 16K Software tested Phase 1 driver (version) 12 1.2 1.2 1.1 2.0.1 20 Phase 2 driver (version) 2.0 none Diagnostic software no по yes no Other Warranty period 1 year 1 year 1 year 1 year Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (800) 252-7775 Cabletron Systems, Inc. 35 Industrial Way Rochester, NH 03867 Vendor Asante Technologies, Inc. Cayman Systems, Inc. 26 Landsdowne Cambridge, MA 02139 (617) 494-1999 405 Tasman Drive Sunnyvale, CA 94089 (800) 662-9686 (603) 332-9400

<sup>\*</sup>If a different interface is required to support a cable type, its name and price are listed. 
\*Add-on twisted-pair transceivers are available from Farallon and Synoptics.

Add-on optical-fiber transceivers are available from DuPont and Cabletron.
All vendors plan to offer Phase 2 support, either by the time this report is in print or soon after.

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real world, switching between Phase 1 and 2 is a rare occurrence. And when you need to do so, you can avoid crashes by starting up with the Phase 1 drivers active (instead of LocalTalk) and then switching over to Phase 2 as needed.

Some cards take longer than others to switch between Phase 1 and Phase 2 drivers. The SE/30 card from Cabletron takes a disconcerting 15 seconds, for example — and because it gives no onscreen warning that it's busy, we were at first convinced that our Mac had crashed. The Racal InterLan for the Mac II, on the other hand, switches drivers the fastest (in less than 3 seconds).

## **Foreign Affairs**

If you plan to use your Ethernet interface to communicate with a VAX or UNIX system, you must layer additional software atop your Phase 1 or Phase 2 driver. The most common network protocols in use by these computers are DECnet (VAX) and TCP/IP (both UNIX and VAX). Some applications that need to speak these protocols provide and manage this additional software themselves, transparently to users. For instance, Inter-Con's TCP/Connect — a software package that provides TELNet UNIX terminal emulation and FTP (File Transfer Protocol) — lets users simply launch and go about their business (perform remote log-ins, file transfers, and so forth). In other cases, such as with Alisa System's TSSNet (DECnet's analog to TCP/Connect), users must drag special INITs and other files into the System Folder.

To see whether each Ethernet interface was compatible with TCP/IP, we ran TCP/ Connect and logged in remotely to a NeXT, a UNIX machine that speaks TCP/ IP. Each interface performed flawlessly. Similarly, we tested DECnet compatibility by running Alisa's TSSNet and copying files between a Mac and a DEC MicroVAX 2000. The NuBus and SE/30 cards did fine, as did the SCSI interfaces. None of the SE cards allowed access to the VAX, however, Although Alisa Systems assured us that it had never experienced this problem, all our efforts to establish an SE-to-VAX link were in vain. In the black-magic world of networking, sometimes even the experts are stumped.

Diagnostic software and manuals with detailed troubleshooting guides may not seem important features until you find yourself in a similarly vexing situation. Of all the documentation we pored through, we especially appreciated Dove's thorough manual, which included an excellent troubleshooting guide, an overview of Ethernet, and general tips on

	NuBus	NuBus	NuBus	NuBus
	Dove FastNet III	Everex EMAC SpeedLink II	Novell EtherPort II	Racal InterLan MacConnect
Mouse rating	\$\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	111	\$\$\frac{1}{2}	\$\$\$\$ <sup>1</sup> / <sub>2</sub>
List price	\$599	\$549	\$595	\$549
Comments	Slowest NuBus card. Good diagnostics. No Phase 2 driver at press time.	Average performer. Good software. Tied for least expensive NuBus card.	Second-slowest NuBus card. No diagnostic software.	Tied for fastest and least expensive NuBus card. No diagnostic software.
Cable support*	III III III III III III III III III II			
Thick coaxial	included	included	included	included
Thin coaxial	included	included	included	included
Twisted pair <sup>†</sup>	no	no	EtherPort IIL (\$645)	MacConnect 10BT (\$625
Optical fibers	no	по	no	no
Hardware				
Manufacturer (OEM)	proprietary	proprietary	proprietary	proprietary
Chip set	Advanced Micro Devices	Intel	National Semiconductor	National Semiconductor
Data-bus width (bits)	16 bits	16 bits	16 bits	32 bits
On-board RAM (bytes)	64K	16K	8K	16K
Software tested	Branca House			
Phase 1 driver (version)	1.2	1.2	3.25	1.1
Phase 2 driver (version) <sup>o</sup>	none	2.0	3.25	2.0
Diagnostic software	yes	yes	no	no
Other	lane.		DEEDE -	
Warranty period	1 year	1 year	1 year	1 year
Vendor	Dove Computer Corp. 1200 N. 23rd St. Wilmington, NC 28405 (800) 622-7627	EMAC 48431 Milmont Drive Fremont, CA 94538 (800) 821-0806	Novell, Inc. 1340 Treat Blvd. Suite 500 Walnut Creek, CA 94596 (800) 526-5463	Racal InterLan, Inc. 155 Swanson Road Boxborough, MA 01719 (800) 526-8255

If a different interface is required to support a cable type, its name and price are listed.

Add-on twisted-pair transceivers are available from Farallon and Synoptics.

Add-on optical-fiber transceivers are available from DuPont and Cabletron.

<sup>&#</sup>x27;All vendors plan to offer Phase 2 support, either by the time this report is in print or soon after.

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networking. We were also impressed by Dove's diagnostic software, which is easy to operate and gives useful responses. Cabletron also has excellent diagnostic software, although it's oriented more to power users or technicians than to novices. At the other end of the spectrum is Asante, with no diagnostic software at all and a manual (a leaflet, actually) containing the bare minimum of information.

## Speed Is All You Need

Aside from ease of installation and quality of diagnostics, it's easy to tell a good Ethernet interface from a not-sogood one: A good one moves files fast. We first installed each interface in a client Mac and then swapped large and small files to and from a Mac IIcx AppleShare file server (see Figure 2). Next we turned the tables by hooking up each interface to the server and clocking how quickly it could answer simultaneous requests from three clients (see Figure 3). The SCSI adapters underwent two sets of tests: first on a fast SE/30 and then on a pokey Plus.

We tested each interface with Phase 1 drivers and again with Phase 2 drivers, if they had been supplied by the interface vendor. If you're planning to convert to Phase 2, remember that the vendors who have not yet shipped Phase 2 drivers are sure to do so soon. If you're planning to stay with Phase 1, check out the Phase 2 results anyway - the speedy performance of most of the Phase 2 drivers might make you rethink your plans.

When 400K files are transferred, the speed differences within any class of interfaces aren't worth noting. With files of 2 megabytes and more, however, some interfaces begin to pull away from their pack. As clients, the Apple EtherTalk NB, Cayman GatorCard E/II, and Racal

InterLan MacConnect — all running Phase 1 in a IIcx — turned in the best performances. The server prize goes to the Cabletron E5000 running Phase 2 in an SE/30 (see the "NetResult: The Best File Server" sidebar).

Different manufacturers' products win "best of show" on different Macs. Apple, Cayman, and Racal InterLan's all perform well on a client IIcx, but Racal InterLan's falls behind when used in the server. The Asante MacCon SE 30/E and Cabletron E5000 tie as the best client and split the server honors: the MacCon SE 30/E when running Phase 1 and the E5000 for Phase 2. Dove's interfaces fall far behind on both client and server IIcx and SE/30 tests. The FastNet SE gives a strong performance on a client SE but is still beaten handily by the 3Com EtherLink/ SE. Cabletron's Phase 2 expertise again shows its winning form on the SE tests.

	SES.	rfaces, continued		
	NuBus	SE/30	SE/30	SE/30
	3Com EtherLink/NB	Asante MacCon SE 30/E	Cabletron E5000	Dove FastNet SE/30
Mouse rating	\$\$\$\frac{1}{2}	\$\$\$\$ <u>1</u>	\$\$\$\$ <sup>1</sup> / <sub>2</sub>	\$\$\frac{1}{2}
list price	\$595	\$595	\$699	\$599
Comments	Average performer. Should do as well as Apple card with new drivers (same hardware).	Fastest Phase 1 server. Fastest raw performance of all interfaces.	Fastest Phase 2 server. Optional fiber- optics transceiver.	Slowest Phase 1 SE/30 card. No Phase 2 driver at press time. Good diagnostics.
Cable support*				
Thick coaxial	included	included	included	included
hin coaxial	included	included	included	included
Wisted pair <sup>†</sup>	no	MacCon SE 30/ET (\$645)	E5020 (\$699)	no
Optical fibers	no	no	E5030SNA/40ST (\$899)	no
lardware				
Manufacturer (OEM)	proprietary	proprietary	proprietary	proprietary
Chip set	National Semiconductor	National Semiconductor	National Semiconductor	Advanced Micro Devices
Data-bus width (bits)	32 bits	32 bits	16 bits	16 bits
On-board RAM (bytes)	16K	16K (64K option, \$50)	16K (64K option, \$50)	64K
Software tested				
Phase 1 driver (version)	21.1	1.2	1.2	1.2
hase 2 driver (version)°	none	2.0.1	2.0	none
Diagnostic software	yes	no	yes	yes
Other				
Varranty period	3 years	1 year	1 year	1 year
/endor	3Com Corp. 3165 Kifer Road Santa Clara, CA 95052 (800) 638-3266	Asante Technologies, Inc. 405 Tasman Drive Sunnyvale, CA 94089 (800) 662-9686	Cabletron Systems, Inc. 35 Industrial Way Rochester, NH 03867 (603) 332-9400	Dove Computer Corp. 1200 N. 23rd St. Wilmington, NC 28405 (800) 622-7627

<sup>\*</sup>If a different interface is required to support a cable type, its name and price are listed.

<sup>&#</sup>x27;Add-on twisted-pair transceivers are available from Farallon and Synoptics.

Add-on optical-fiber transceivers are available from DuPont and Cabletron.
All vendors plan to offer Phase 2 support, either by the time this report is in print or soon after.

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\*All prices and specifications are subject to change without notice.

BMUG (Berkeley Macintosh User Group) Newsletters Choice Product section says... "It's fast, reliable and trouble-free; the best of all Syquest removable drives available". (Winter/Spring 89) DPI has been listed in this category for the last three bi-yearly issues.

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In general, the slower the CPU, the slower the performance of Ethernet cards. One interesting exception is the superior server performance put on by the SE/30 cards — interesting because the SE/30 shares the same CPU as the IIcx we used to test the NuBus cards. SCSI adapters turned in the slowest times — even when linked to a powerful SE/30 — because they have the limitations of SCSI to contend with (see "SCSI Accelerators," March '90, page 175).

Of the SCSI adapters, only the Compatible Systems Ether+ and Nuvotech NuvoLink SC can be used on AppleShare file servers. Because of a software incompatibility, Apple recommends that you not use SCSI as the Ethernet interface to AppleShare. We concur. Nuvotech and Compatible Systems have created a workaround; Adaptec and Dove have not. But when we tested the server

performance of the Ether+ and Nuvo-Link SC, we found it nothing to write home about — we doubt that the workarounds were worth the trouble. As clients, the Nuvotech NuvoLink SC and Compatible Systems Ether+ reign supreme in the SCSI world, with the Nodem and FastNetSCSI lagging far behind.

After testing file-transfer speed, we looked at another common network chore: accessing multiuser databases. We commissioned a network-crunching 4th Dimension application from The Automation Group and let it loose to winnow out a winner. No luck. Even though we tested every Ethernet interface in every configuration, no champion emerged in any of the four groups. Apparently, 4th Dimension overhead and hard-disk activity completely overshadowed differences among the interfaces.

This finding - combined with further

investigation - led to one of our most important conclusions: Much (if not most) of Ethernet's advantage can be wiped out if your hard-disk drive or the hard disk on your server is a dog. To test this hypothesis, we used the fastest NuBus performer, the Cayman GatorCard E/II, on a client Hex and downloaded a 2-megabyte file from an AppleShare server. We used three different hard-disk drives on the server: a Heart Data Corp. DCX 45 with a respectable — if not stunning — access time of 28 milliseconds, a speedy 19millisecond Heart HD 1085, and a blazingly fast 10.7-millisecond FWB hammer300FMF.

As expected, file-transfer times were fastest for the fastest drive and slowest for the slowest drive — but the difference was a full 100 percent. If you spend thousands of dollars upgrading your network to Ethernet but fail to upgrade your

## Table 1: Features of Ethernet Interfaces, continued

	SE/30	SE/30	SE	SE
	Everex EMAC SpeedLink SE/30	Novell EtherPort SE/30	Asante MacCon SE/E	Cabletron E4000
Mouse rating	***	111	1111	\$\$\$\frac{1}{2}
List price	\$549	\$595	\$425	\$599
Comments	Slowest Phase 2 SE/30 server. Good performance as client. Good diagnostics.	Average price and performance. No diagnostic software.	Great buy! Second- best SE client. Least expensive of all interfaces.	Slowest Phase 1 SE client. Fastest Phase 2 SE server. Fiber- optics option.
Cable support*		577		
Thick coaxial	included	included	included	included
Thin coaxial	included	included	included	included
Twisted pair <sup>†</sup>	по	EtherPort SE/30L (\$645)	MacCon SE/ET (\$445)	E5020 (\$599)
Optical fibers	no	no	по	E5030SNA/40ST (\$899)
Hardware				
Manufacturer (OEM)	proprietary	proprietary	proprietary	proprietary
Chip set	Intel	National Semiconductor	National Semiconductor	National Semiconducto
Data-bus width (bits)	16 bits	16 bits	16 bits	16 bits
On-board RAM (bytes)	16K	8K	16K	16K (64K option, \$50)
Software tested				
Phase 1 driver (version)	1.2	3.25	1.2	1.2
Phase 2 driver (version)°	2.0	3.25	2.0.1A	2.0
Diagnostic software	yes	по	no	yes
Other				
Warranty period	1 year	1 year	1 year	1 year
Vendor	EMAC 48431 Milmont Drive Fremont, CA 94538 (800) 821-0806	Novell, Inc. 1340 Treat Blvd. Suite 500 Walnut Creek, CA 94596 (800) 526-5463 (415) 947-0998	Asante Technologies, Inc. 405 Tasman Drive Sunnyvale, CA 94089 (800) 662-9686	Cabletron Systems, Inc. 35 Industrial Way Rochester, NH 03867 (603) 332-9400

<sup>&#</sup>x27;If a different interface is required to support a cable type, its name and price are listed.

Add-on twisted-pair transceivers are available from Farallon and Synoptics. Add-on optical-fiber transceivers are available from DuPont and Cabletron.

All vendors plan to offer Phase 2 support, either by the time this report is in print or soon after

## Send Files over AppleTalk —in a Flash!

Flash is the fastest, friendliest file transfer program you can buy for the Macintosh. Unleash the power" of your AppleTalk network with Flash.

Quickly send files and messages to any other Macintosh—or group of Macintoshes—on the network. Flash even has a chat mode that lets you talk in real-time to anyone else.

## Chat Lisa. I got the Watson account figures ready just in time. The boss wants to get together in 10 minutes Oh no! Flash me those files, will you? I need a chance to review them No trouble. See you in the conference

Both people type into note pad when chatting.



To send files to a person or group, just drop them in a folder.

## Flash is Fast

- To send a file, just drop it into a Flash folder and off it goes!
- All file transfers are done in the background, so you never have to wait. Flash works while you do.
- Flash's transfer rate is almost 1MB per minute. Most files are sent in

## Flash is Powerful

- → Flash can send and receive any combination of files and folders at the same time.
- The contents of an entire hard drive can be transferred-while you use both computers!
- Flash can communicate across any AppleTalk network zones that also have Flash installed.

## Flash is Friendly

- Flash is perfectly integrated into the Macintosh desktop environment.
- Installation is so easy you'll be using Flash in minutes-not just reading about it!
- You can use Flash anytime, from inside any application.
- Flash tells you when your files arrive, so there's no need to keep checking. But, in case you forget, Flash keeps a record of all file transfers.

## **Software Requirements**

All Macintoshes on the network must be running System 6.0 or newer

## Hardware You Need

- An AppleTalk compatible network.
- Two or more Macintoshes with a minimum of 1MB of memory.

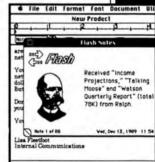
## Hardware You Don't Need

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- Dedicated File Server not required—Flash will save you thousands of dollars by keeping all of your Macintoshes free for productive uses.

## Only \$199.95!

You can use Flash with any number of Macintoshes in a single AppleTalk network zone. And, you can add as many Macintoshes as you need to each zone at no extra cost. You are not required to purchase more than one Flash

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server's hard-disk drive, you're wasting your money.

## In the Raw

After uncovering this truth, we stepped beyond the workaday world to test each interface's raw performance - that is, how fast it can shovel data without being held up by a hard-disk drive, CPU, or SCSI port (see Figure 4). The speeds we uncovered can't be approached in realworld situations, but the real world is changing as hardware improves. A Yugo that can keep up with a Ferrari from stoplight to stoplight will find itself eating the Ferrari's dust if someone removes those lights tomorrow. Similarly, existing network bottlenecks can be minimized or eliminated, thus unleashing the fastest raw performers.

To test raw performance, MacUser NetWorkShop developed NetBasher! and

used it with Network General's Sniffer to measure how much traffic a particular Ethernet interface could transmit and receive. NetBasher! pushed each interface to its limit, whereas Sniffer measured what that limit was.

Once again, the top performers were the NuBus cards from Cayman, Racal InterLan, and Cabletron and the SE/30 cards from Asante and Cabletron. The 3Com EtherLink/SE was the SE-card winner, and the Adaptec Nodem led the SCSI pack — surprising, after its weak file-transfer performance. And once again, Dove's cards fared the worst; Novell's cards didn't put in a particularly good showing either.

The raw-performance tests also showed the value of having a 32-bit-wide data bus that is, the ability to transfer data 32 bits at a time. A 32-bit bus (and the driver to capitalize on it) is usable only by

SE/30s and the Mac II family because other Macs can accept data only 16 bits at a time. The five cards with 32-bit buses finished in the top seven in NetBasher! testing. Surprisingly, the 16-bit Cabletron E6000 and E5000 beat the 32-bit Asante MacCon II/E and 3Com EtherLink/NB.

Many vendors also tout the benefits of large amounts of on-board RAM - the justification being that in some situations, bursts of closely spaced packets (referred to as back-to-back packets) arrive too quickly and swamp the Mac's CPU. With on-board RAM, these packets can be buffered on the Ethernet card until the CPU is free to process them. Otherwise, the packets will be dropped, meaning they'll be lost and the sender will have to retransmit. Fewer retransmissions equal better performance.

We found no correlation between onboard RAM and interface performance,

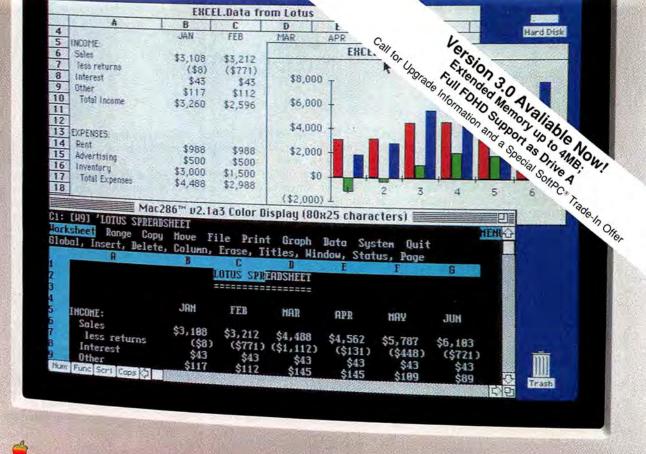
	SE	SE	SE	SCSI
	Dove FastNet SE	Novell EtherPort SE	3Com EtherLink/SE	Adaptec Nodem
Mouse rating	<b>\$</b> \$\$	\$\$\frac{1}{2}	***	***
List price	\$599	\$595	\$595	\$495
Comments	Average performance. Good diagnostics.	Average performance. Erratic performance using Phase 2 driver as client.	Fastest SE client, server, and raw perfor- mance. No Phase 2 driver at press time.	Poor file-transfer performance. Best raw performance by a SCSI adapter.
Cable support*				
Thick coaxial	included	included	included	Nodem E
Thin coaxial	included	included	included	Nodem C
Twisted pair <sup>t</sup>	no	EtherPort SEL (\$645)	no	Nodem T (\$595)
Optical fibers	no	no	no	по
Hardware	AND THE PARTY OF			
Manufacturer (OEM)	proprietary	proprietary	proprietary	proprietary
Chip set	Advanced Micro Devices	Intel	Intel	proprietary
Data-bus width (bits)	16 bits	16 bits	16 bits	8 bits
On-board RAM (bytes)	64K	8K	16K	32K
Software tested				3, 3, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,
Phase 1 driver (version)	1.3.1	2.5	1.0	1.2B
Phase 2 driver (version)*	none	2.5	none	2.01A
Diagnostic software	yes	no	yes	по
Other			100	
Warranty period	1 year	1 year	3 years	1 year
Vendor	Dove Computer Corp. 1200 N. 23rd St. Wilmington, NC 28405 (800) 622-7627 (919) 763-7918	Novell, Inc. 1340 Treat Blvd. Suite 500 Walnut Creek, CA 94596 (800) 526-5463 (415) 947-0998	3Com Corp. 3165 Kifer Road Santa Clara, CA 95052 (800) 638-3266 (408) 562-6400	Adaptec, Inc. 691 S. Milpitas Blvd. Milpitas, CA 95035 (408) 945-2518

<sup>\*</sup>If a different interface is required to support a cable type, its name and price are listed.

\*Add-on twisted-pair transceivers are available from Farallon and Synoptics.

\*Add-on optical-fiber transceivers are available from DuPont and Cabletron.

All vendors plan to offer Phase 2 support, either by the time this report is in print or soon after.



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Because the Mac286/86 solutions are Intel microprocessor based, they offer the highest level of MS-DOS compatibility available. You can use d-Base IV<sup>TM</sup>, Lotus 1-2-3<sup>TM</sup>, WordPerfect® or MS-Word® simultaneously with your favorite Mac programs.

With new FDHD support, you can run most programs directly from the Mac's SuperDrive. And recently added extended memory allows you to expand Mac286 to 4Mb of RAM, available to EMS utilities and DOS applications.

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Mac286 and Mac86 not only add DOS to your Mac, they blend the two environments to maximize your productivity. Mac286 and Mac86 are compatible with TOPS™. Copy and paste from MS-DOS programs into MacWrite™, PageMaker™, or other popular Mac software. You can tansport files between Mac and MS-DOS formats in two quick steps with Mac286's D:Drive feature. Whatever your

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however. A performance increase might be observed if the interface were used in a Mac running Apple Internet Router (see "EtherTalk-to-LocalTalk Routers" in this buyer's guide). A router directs traffic between two or more networks and often becomes so besieged by traffic that its CPU cannot keep up. When this happens, data on the network is dropped and must be re-sent. A RAM buffer might help by storing data until the CPU has time to deal with it — but we're making no promises.

Dove's FastNetSCSI is a unique device. It contains its own CPU, intended to lighten the Mac's network-processing load. Unfortunately, no AppleTalk software currently exists to take advantage of the FastNetSCSI, and it performed poorly in all our tests. We look forward to learning whether the on-board CPU can make a difference if performance-enhancing software is ever developed for it.

# **Investment Counseling**

Installing an Ethernet network is no small investment, in either money or time. There's the cost of the interfaces, the inevitable routers, the cable, and — if you're smart — fast hard-disk drives for your file servers. Plus, you must plan your network, install the cable, set up each node, and tune the whole system to your needs. Before you start down this slippery slope, we recommend that you examine your needs carefully and do all you can to optimize your existing Local-Talk network.

But if your network is growing, if you're moving large files, or if you need access to a VAX or UNIX system, you should definitely investigate Ethernet. With few exceptions, the interfaces we tested offer fast, reliable performance at a reasonable price. If budget is a major consideration, we recommend skipping

the most expensive interfaces, because the more affordable ones perform as well or better.

Apple started a revolution when it put network capability into every Mac. Today, manufacturers such as Sun Microsystems and NeXT are upping the ante to Ethernet. Until Apple joins this new network wave, an Ethernet interface card may be your best bet for dramatically upgrading your network's performance.

The Zarboulas brothers are cofounders of Santorini Consulting & Design, Inc. They recently completed work on a major network-management application with Farallon Computing and are planning release of their own products.

### Acknowledgments

MacUser NetWorkShop would like to thank Alisa Systems, Heart Data, InterCon, Network General, and Radius for their help with test equipment and software.

	SCSI	SCSI	SCSI
	Compatible Systems Ether+	Dove FastNetSCSI	Nuvotech NuvoLink SC
Mouse rating	\$\$\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<b>\$</b> \$	\$\$\$\frac{1}{2}
List price	\$495	\$1,249	\$495
Comments	Best SCSI-adapter client performance. Must reinstall to switch from Phase 1 to 2.	Slowest raw perfor- mance of all interfaces. On-board CPU. Expensive.	Very good SCSI-adapter client performance. Same internal hardware as Ether+.
Cable support*			
Thick coaxial	included	\$100 option	included
Thin coaxial	included	included	included
Twisted pair <sup>†</sup>	no	по	no
Optical fibers	no	no	no
Hardware		The second of	BW LEED TO THE RESERVE TO THE RESERV
Manufacturer (OEM)	proprietary	proprietary	Compatible Systems
Chip set	National Semiconductor	Advanced Micro Devices	National Semiconductor
Data-bus width (bits)	8 bits	8 bits	8 bits
On-board RAM (bytes)	16K	512K (2-MB option, \$699)	32K
Software tested			
Phase 1 driver (version)	1.22	1.2	1.22
Phase 2 driver (version)	1.22	none	none
Diagnostic software	yes	yes	yes
Other	Election -		Emini Scarce
Warranty period	1 year	1 year	1 year
Vendor	Compatible Systems Corp. P.O. Drawer 17220 Boulder, CO 80308 (800) 356-0283 (303) 444-9532	Dove Computer Corp. 1200 N. 23rd St. Wilmington, NC 28405 (800) 622-7627 (919) 763-7918	Nuvotech, Inc. 2015 Bridgeway, Suite 204 Sausalito, CA 94965 (800) 232-9922 (415) 331-7815

<sup>\*</sup>If a different interface is required to support a cable type, its name and price is listed.

Add-on twisted-pair transceivers are available from Farallon and Synoptics. Add-on optical-fiber transceivers are available from DuPont and Cabletron.

Add-on optical-fiber transceivers are available from DuPont and Cábletron.
All vendors plan to offer Phase 2 support, either by the time this report is in print or soon after.

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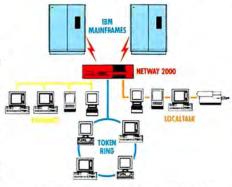
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solutions typically cost \$1200 per session.

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And with our rich set of APIs, you can also customize applications for Macintoshlike access to mainframe data. Products such as CL/1™(and CLEARAccess™), MitemView™ and MacPROFF™already use our APIs to provide solutions that fit your needs.

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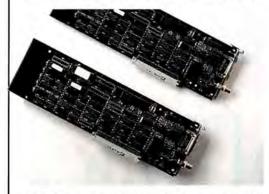
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# The Bottom Line

It wasn't easy to pick the best Ethernet interface — it's a dirty, thankless job, but somebody's got to do it. With few exceptions, the interfaces we tested performed well, although none stood out as spectacular. For small file transfers and multiuser-database access, the differences among interfaces in each category are minimal — almost imperceptible. After a month of testing, we discovered that large-file-transfer rates and raw-performance tests separated the best from the merely good.

In addition to identifying the winners in each category, we make one additional recommendation; consider price carefully. Even though list prices may seem similar, remember that you'll probably be buying dozens of these interfaces if you're upgrading an entire network. A \$100-per-interface difference adds up fast — maybe enough to buy that new Ilfx you've been eyeing.



Best NuBus cards: the identical Cayman GatorCard E/II (top) and Racal InterLan MacConnect

There's a good reason why the Cayman GatorCard E/II (\$595) and Racal InterLan MacConnect (\$549) should share top NuBus honors. They both use the Racal InterLan card, which is top-notch hardware. Both led their category in raw performance and when doing file transfers as a client Ilcx. Apple's EtherTalk NB (\$699) also performed well in real-world tests, but it costs \$100 to \$150 more.

The race was tight in the SE/30-client tests, but the Asante MacCon SE 30/E (\$595) and the more expensive Cabletron E5000 (\$699) pulled away from the rest in server performance and buried their competition in raw-performance tests (the MacCon SE 30/E beat all interfaces from all categories). If you're installing an Ethernet server, you can't do better than an SE/30 with a MacCon SE 30/E running EtherTalk Phase 1 or an E5000 running Phase 2.

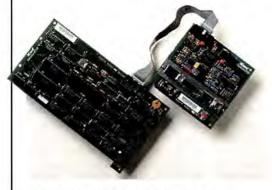
Our SE-interface testing produced one clear winner: the 3Com EtherLink/SE (\$595). Its performance in a client SE was more than



Best SE/30 cards: the Cabletron E5000 (left) and Asante MacCon SE 30/E

acceptable, and in a server, it even beat most NuBus cards. Its raw performance was more than 40 percent better than that of its nearest competitor, the Cabletron E4000 (\$599). The folks at 3Com must be confident of the EtherLink/SE's quality, because they stand behind it with a three-year warranty — the longest in the industry. Another SE interface worth looking at is the Asante MacCon SE/E (\$425). Its solid real-world performance and excellent price (lowest of all interfaces) make it a best buy.

Although SCSI adapters are, as a group, slower than their card cousins, they're indispensable if you have a Plus or a Portable or no room for an extra card in your SE, SE/30, or II. The Compatible Systems Ether+ (\$495) and Nuvotech NuvoLink SC (\$495) use the same hardware to easily beat their SCSI competitors. They are clumsy to configure — the Adaptec Nodem (\$495) is far easier to use - but their performance makes up for it.



Best SE card: the 3Com EtherLink/SE



Best SCSI adapters: the Nuvotech NuvoLink SC (left) and Compatible Systems Ether+

If you want to connect a Local-Talk network to Ethernet, you'll need one of these routers.

> KEE NETHERY MACUSER **NETWORKSHOP** STAFF

ou've just converted your very sluggish AppleTalk network to Ethernet, only to discover that printing to your Laser-Writer is not possible. The reason? Macs on high-speed Ethernet networks can't communicate directly with print-

ers - or other Macs - on lower-speed LocalTalk networks. LocalTalk, the network connection built into Macs and LaserWriters, sends and receives network signals at a mere 230,400 bps (bits per second), whereas Ethernet transmits at 10 million bps (see "Are You Ready for Ethernet?" in this buyer's guide). Since you can't put an EtherTalk card into a LaserWriter, your printer will gather dust until you install a router to manage the speed conversion necessary for data transfers between EtherTalk and LocalTalk networks (see Figure 1).

EtherTalk-to-LocalTalk routers are

also key ingredients in two other network scenarios. If you have an AppleShare server on an Ethernet network and you want to access its files from a Mac on a LocalTalk network - a common situation in corporate environments - you'll need a router (see Figure 2). Or you may want to improve the snail-like performance of a sprawling series of LocalTalk networks by installing an Ethernet backbone (see Figure 3). Again, you'll need a router for each LocalTalk network you hook up to Ethernet.

At its simplest, a router connects two or more networks to create an internet, or "network of networks" (see "How to Set Up the Perfect Network" in this buyer's guide). An internet maintains distinct network addresses for each network it contains. On any network within the internet, data flows between computers, printers, and other devices (referred to as nodes) in chunks called data packets. A router straddles the junction of two or more networks and "listens" to the activity on all the networks attached to it. When a data packet from a node on one



network is bound for a node on another network, the router takes the packet from the sending network, stores it in a holding area (called a *buffer*), and then forwards it to the second network when there's a lull in that network's activity. (See "Network Glossary" in this buyer's guide for definitions of unfamiliar terms.)

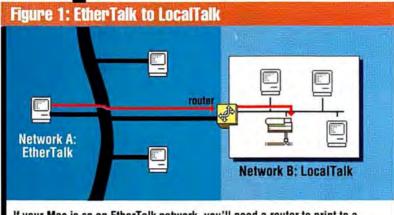
If it were that simple, you could choose a router solely on the basis of price and performance (how fast a router sends packets from one network to another). But nothing in networking is simple, alas, and routing is no exception. MacUser NetWorkShop took an in-depth look at five EtherTalk-to-LocalTalk routers, ranging in price from \$295 to \$2,795. Apple's AppleTalk Internet Router and Infosphere's Liaison are software packages that run on the Mac. The Cayman GatorBox, Novell Kinetics FastPath 4, and Shiva EtherGate are dedicated hardware boxes. We ran speed tests and found that throughput varies from router to router. But the special features a router has to offer - dial-up modem access, security, maximum number of networks, cost, and types of network protocols supported — can be much more significant than speed when you are creating an internet.

# **Router Features**

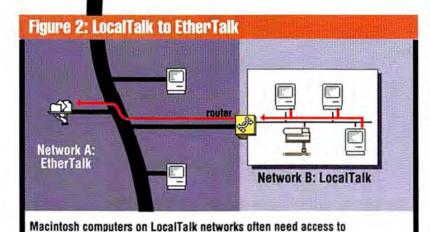
Routers vary in the type and number of networks they support. Of the five routers we tested, all support connection to at least one LocalTalk and one EtherTalk network. All the routers are compatible with each other, so you can mix them according to your needs. You can put two or more routers together to construct a far-reaching internet of EtherTalk and LocalTalk networks. Some go further still and let you establish a gateway to UNIX-based TCP/IP (transmission control protocol/internet protocol) and VAX-based DECnet networks.

Whether a router's functions are carried out in software or hardware, it has software you must correctly install on a Macintosh or into the hardware box and configure with network information specific for your internet — network addresses, for example. You must also



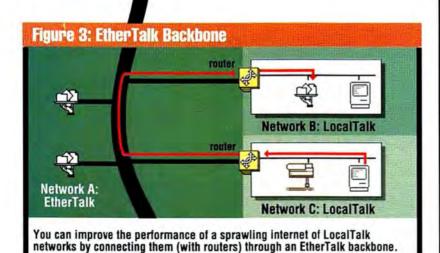


If your Mac is on an EtherTalk network, you'll need a router to print to a LaserWriter (or to communicate with other devices on a LocalTalk network).



AppleShare servers on EtherTalk networks. A router handles the

required speed and protocol conversions.



connect the network cables to the router. With a software router, these connections are to ports in your Mac; with a hardware router, you make the connections to ports in the box itself.

# **Software Routers**

AppleTalk Internet Router. This software router can support up to eight network connections, depending on the number of expansion slots available in your Mac. You can attach two LocalTalk networks, one to each of the Mac's serial ports (printer and modem). The Internet Router comes with a Phase 2 Upgrade Utility that lets it communicate between AppleTalk Phase 1 and Phase 2 networks (see the "AppleTalk Phase 2" sidebar).

If you run the Internet Router on an SE or SE/30, you're limited to one EtherTalk or TokenTalk network. If you have a Mac II, IIx, IIxi, or IIfx, you can connect up to six EtherTalk or TokenTalk networks, one for each NuBus card you install. On a IIcx or IIci, you can attach only three such networks, since these models have only three NuBus slots. (Unless you have a IIci, you'll probably want to put a video card into one of these slots. Don't try to save the cost of a monitor by using Farallon's Timbuktu for remote monitoring. It's all

# AppleTalk Phase 2

If you have a sprawling AppleTalk network, fashioned over the course of time, you're no doubt painfully aware of AppleTalk's 254-node limit. You don't have to be a member of the Fortune 500 to hit that ceiling quickly, what with LaserWriters, network modems, AppleShare servers, and mail and print servers — plus all your Macs gobbling up node addresses.

Relief is in sight, however: AppleTalk Phase 2 enables an EtherTalk internet to contain more than 16 million network addresses (in theory, anyway). Phase 2 also streamlines router-to-router communications and lets Macs connect to token-ring networks (see "Finally Phase 2," November '89, page 248). As a network user, you may not be fazed by the changes, but if you plan to buy an EtherTalk-to-LocalTalk router, grab a pencil and take notes — you won't want to mess this up.

For starters, networks in AppleTalk Phase 2 can have more than one network address. Phase 1 allows 254 nodes per network number, and only one network but impossible to troubleshoot router problems without a monitor actually attached to the Mac.) You can password-protect access to the Internet Router configuration DA (more on this DA later), and you can always secure the Mac the low-tech way, by locking it in a closet. You can operate the router in the background of a print-, file-, or mail-server Mac, but if you do so, you should expect reduced performance, depending on how active the server is when the router is busy.

Infosphere Liaison. Liaison supports two LocalTalk connections via the Mac's printer and modem ports, and it also supports one network-interface card. The serial ports can be connected to Local-Talk or FlashTalk networks: the network card can be either Ethernet or Arcnet. (FlashTalk is a speedier version of Local-Talk available from TOPS: see "Breaking the Speed Limit," October '89, page 246.) Liaison is an economical alternative when run in the background of a file-(or other-) server Mac, but again, depending on how active your server and router are at any given time, both may display diminished performance.

Liaison's key feature is its dial-up capability. If you attach a modem to a Mac

# **Table 1: Features of Software Routers**

Mouse rating	Apple AppleTalk Internet Router 主主主	Infosphere Liaison	
List price*	\$399	\$295	
internet with EtherTalk and in TokenTalk, Poor technical G		Fast, consistent response. Easy installation. Dial-up capabilities. Great technical support. Excellent entry-level router.	
Version number	2	2.0.6	
Phase 2 support	yes	no	
Mixed Phase 1 and 2	yes	no	
Cabling support	thick or thin coaxial, twisted-pair	thick or thin coaxial, twisted-pair	
Configuration protection	password	password	
Gateway functions	none	none	
Hides resources	no	zones only	
Modem capabilities	none	dial in, dial out	
Dial-in security NA		password, user authentication	
Number of ports 2 LocalTalk, 6 Ethernet		2 LocalTalk, 1 Ethernet	
Warranty (media only)	90 days	90 days**	
Technical support	authorized dealers	unlimited, free	
Manufacturer	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014-6299 (408) 996-1010	Infosphere, Inc. 4730 S.W. Macadam Ave, Portland, OR 97201 (503) 226-3620	

\*Doesn't include Mac.

'Cabling support depends on installed network card.

Depends on available slots in Mac. Also supports TokenTalk.

Also supports FlashTalk and ArcTalk.
\*\*30-day money-back guarantee if bought directly from Liaison.



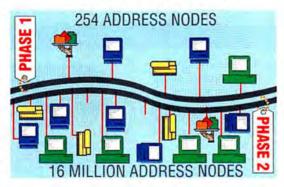
number per network cable. AppleTalk Phase 2 allows a range of network numbers on the

same cable. The result: An Ethernet cable can support thousands of EtherTalk nodes. (LocalTalk is still limited to 254.) For this to work, all the Ethernet cards and routers in your internet must be "in phase" — that is, they must all be Phase 2. Ultimately, all EtherTalk internets will be Phase 2, but at the moment, many AppleTalk internets are in transition. In addition, not all EtherTalk-card yendors have

Phase 2 drivers, nor do all routers support Phase 2 protocols.

Phase 2 also differs from Phase 1 in its AppleTalk routing protocols. Every ten seconds, routers broadcast network-address information (a routing table) onto the internet. Phase 2 routers handle the details of this directory update more efficiently than do

Phase 1 routers, but all routers on an internet must be Phase 2 to take advantage of the new

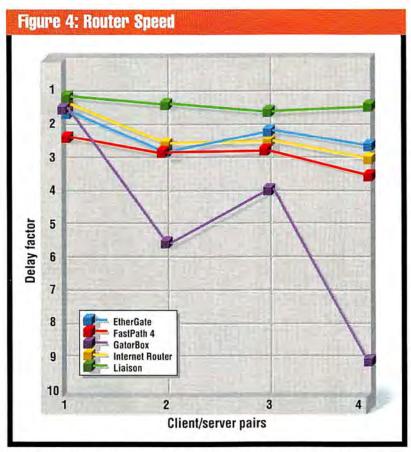


scheme. Mixed Phase 1/Phase 2 internets are possible, if you have a router that can translate between the two protocols. But, as with EtherTalk cards, until all routers are Phase 2, they will all communicate by using Phase 1 protocols.

Of the five routers we tested, the FastPath 4 and AppleTalk Internet Router support

mixed-phase networks; Liaison and the GatorBox support only Phase 1; and the EtherGate supports either phase, but not both simultaneously. (In April, Cayman Systems, Infosphere, and Shiva announced software upgrades for AppleTalk Phase 2 and mixed-phase network support. See the "On the Horizon" sidebar.)

When upgrading your internet from Phase 1 to Phase 2, remember these rules: To upgrade everything at once, you must upgrade your LocalTalk-to-LocalTalk routers, EtherTalk drivers for all EtherTalk cards, and your EtherTalk-to-LocalTalk routers. To make a gradual transition, you must first use routers that can support mixedphase internets. As you upgrade each EtherTalk-to-LocalTalk router to Phase 2. you must simultaneously upgrade the drivers for all EtherTalk cards on the EtherTalk side of the router and all LocalTalk routers on the LocalTalk side. Until you've upgraded all affected devices on the internet, you will not get the benefits of Phase 2's capabilities.



Routers slow things down, even when you're transferring files to and from an EtherTalk network. Our test results show how much longer it took to transfer files between a client and a server Mac through each router, compared with sending the same files without a router. A 5 means that transferring the files through a router takes five times longer than if no routing were involved.

running Liaison, remote Mac users can access your internet. Likewise, users on the internet can dial out, and two AppleTalk networks can be linked via modem. The dial-in feature employs userpassword protection coupled with dialback confirmation of the telephone number from which the call was made. Liaison lets you hide networks from dialin users, thereby limiting outside access to internet services.

# **Hardware Routers**

Cayman GatorBox. The GatorBox has one Local Talk port and one Ethernet port. With GatorShare software installed, the GatorBox gives Mac users seamless access to an NFS (Network File Service) file server on a UNIX platform — all you have to do is click on the AppleShare icon in your Chooser. GatorShare costs \$1,995 over the \$2,795 hardware price, however (see "Sharing: From Apples to Alligators" in the Bridges section, May '90, page 357). Even without GatorShare, the GatorBox has several useful features for UNIX connectivity. It supports KIP (Kinetics Internet Protocol, or "IPTalk"). which lets Macs access CAP (Columbia AppleTalk Package). CAP includes free UNIX-based, AppleShare-compatible file-server software that's used in many university environments.

Novell Kinetics FastPath 4. The Kinetics FastPath 4 also comes with one LocalTalk port and one Ethernet port. This is the fourth incarnation of the Fast-Path line, and the wisdom gained from its

# On the Horizon

Even as we were testing, vendors were remodeling their routers, adding gateway features and support for AppleTalk Phase 2. Here are some important highlights.

Cayman Systems announced version 1.5 of the GatorBox system software. This free upgrade gives registered owners support for AppleTalk Phase 2 and mixed Phase 1/Phase 2 internets. It also enables

tunneling, a networking technique that enables Apple-Talk packets to move from one LocalTalk network to another over a TCP/IP

backbone without EtherTalk. The Gator system-software upgrade also includes new network-management features. such as the ability to filter zones and hide devices on the network.

Infosphere released version 2.1 of Liaison, which supports

AppleTalk Phase 2 and mixed Phase 1/Phase 2 internets. Liaison 2.1 supports up to five network cards in a Mac, including those for FlashTalk, ArcTalk, Token-Talk, and EtherTalk.

Shiva announced Internet Manager 1.46 software for



the EtherGate. This release provides support for mixed AppleTalk Phase 1/Phase internets. Support for TCP/IP should

be available by early summer.

Two other vendors have unveiled new EtherTalk-to-LocalTalk routers. Dove Computer announced the FastNet AE (\$2,295), a hardware router; and Network Resources Corporation (NRC) began shipping a software router, the MultiGate Mac (\$795). (NRC is also now shipping a hardware router, the MultiGate 2000 [\$2,395].)

history shows. Like the AppleTalk Internet Router, the FastPath 4 can route LocalTalk Phase 1, Phase 2, or both. It comes with gateway software (K-Star) that lets you connect your Macs to both UNIX and VAX machines. (K-Star supports the TCP/IP and DECnet protocols.) The FastPath's management software lets you selectively hide networks, LaserWriters, or any other network service, but it has no password protection. (Considering how difficult the FastPath 4 is to configure, password protection would be overkill.)

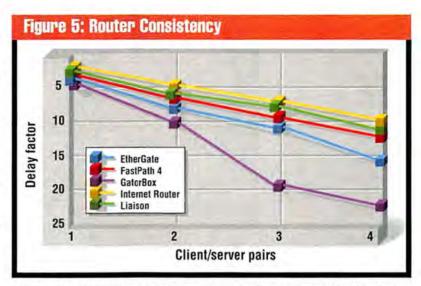
Shiva EtherGate. The EtherGate contains one Ethernet port, and, unlike the other hardware routers, which have dedicated LocalTalk ports, it has two serial ports that can be connected to any serial device, including printers and modems. At press time, the EtherGate could support AppleTalk Phase 1 or 2, but not both simultaneously (see the "On the Horizon" sidebar for new releases).

When a modem is attached to one of its serial ports, the EtherGate allows remote users to dial in and connect to the internet. (With a pair of modems, two EtherGates can link geographically distant AppleTalk networks.) Both the configuration and dial-in access are password-protected, and you can shepherd dial-in users to designated networks. Shiva also offers software (DOS Dial-In 1.01, \$99) that gives remote DOS users access to an AppleTalk internet.

If all your routers carry the Shiva label, you can configure and manage the

In May, NRC announced a TCP/IP option for the MultiGate 2000.) What looks interesting about both NRC products is that the router-management software is built on an Oracle database engine. Initial releases of the Dove and NRC routers support only AppleTalk Phase 1, but support for Phase 2 will follow at a later, undisclosed date.





A router that responds consistently to network traffic keeps users happier than one that's supercharged one minute and bogged down the next. To ascertain router consistency, we measured the difference between the longest and shortest file-transfer times for each client/server pair. The GatorBox handled increased traffic very erratically — file transfers were actually faster when three client/server pairs were sending data than when only two pairs were in action.

EtherGate from any location on the internet, even if your internet spans the globe. Other routers require that you be at the physical unit or on a network directly connected to it.

# Off to the Races

Just as different driving styles can affect the performance of a car, different internet schemes can tax routers in different ways. We looked at the three basic internet configurations that require Ether-Talk-to-LocalTalk routers (see Figures 1, 2, and 3) and constructed test internets to put each router through its paces. Our EtherTalk-to-LocalTalk test looked at how the routers would perform if you were copying a file from an AppleShare server on EtherTalk to a Mac on Local-Talk, Our LocalTalk-to-EtherTalk setup looked at performance in the other direction. Finally, our two-router test (Local-Talk-to-EtherTalk-to-LocalTalk) simulated multiple LocalTalk networks attached to an Ethernet backbone.

Our base test platform consisted of a single client/server pair with a router in between. We used Mac SEs with Novell (Kinetics) Ethernet boards for the clients and Mac IIs with Asanté Ethernet boards for the AppleShare servers. We installed the software routers on both a Mac IIcx and an SE/30. For the LocalTalk-to-Ether-Talk-to-LocalTalk tests, we made an

Nothing in networking is simple, and routing is no exception.

Ethernet backbone using two of the same kind of router.

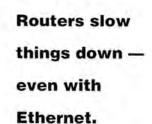
To test router performance, we set up a HyperCard stack on the client Mac that sent ten 1-megabyte files to the Apple-Share file server and logged the results of these time trials. We added a second client/server pair to the configuration and sent files from both client Macs. We repeated the tests with three and four client/server pairs until we had eight Mac nodes on the test networks, four sending and four receiving a succession of ten 1-megabyte files.

We first timed file transfers between client/server pairs on a LocalTalk network with no routers, and then we used these results as a yardstick against which to measure router performance. Each router was tested in all three network

# Table 2: Features of Hardware Routers

	Cayman GatorBox	Novell Kinetics FastPath 4	Shiva EtherGate	
Mouse rating	***	3555	\$\$\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
List price	\$2,795	\$2,795	\$2,399	
Comments	Slowest and least consistent. Not recommended for basic routing. Many gateway features.	Fast. Hardest to install. Good network-management features, Gateway features for UNIX and DEC connectivity.	Fairly slow, but very consistent. Dial-up capabilities. Serial features add versatility.	
Software	GatorSystem, GatorKeeper	K-Star	Internet Manager	
Version number	1.4.1	8.0	1.4	
Phase 2 support	no	yes	yes	
Mixed Phase 1 and 2	no	yes	no	
Cabling support	thick or thin coaxial	thick or thin coaxial	thick or thin coaxial	
CPU	68000	68000	68000	
ROM (kilobytes)	2K	64K	16K	
RAM (kilobytes)	1,000K	256K	192K, expandable to 768K	
Configuration protection	none	none	password	
Gateway functions	TCP/IP, Telnet, KIP/CAP, NFS	Level-1 DECnet, TCP/IP, KIP/CAP	none	
Hides resources	no	zones, printers	zones only	
Modem capabilities	none	none	dial in, dial out	
Dial-in security	NA	NA	password protection	
Number of ports	1 LocalTalk, 1 Ethernet	1 LocalTalk, 1 Ethernet	2 serial, 1 Ethernet	
Warranty	1 year	1 year	1 year	
Technical support	unlimited, free	unlimited, free	unlimited, free	
Manufacturer	Cayman Systems, Inc. 26 Landsdowne St. Cambridge, MA 02139-9732 (617) 494-1999	Novell, Inc. 1340 Treat Blvd., Suite 500 Walnut Creek, CA 94596 (415) 947-0998	Shiva Corp. 155 Second St. Cambridge, MA 02141 (617) 864-8100	

<sup>\*</sup>Additional software required for NFS (GatorShare, \$1,999).



configurations. The Internet Router proved the fastest, followed closely by Liaison and the FastPath 4. These three routers had similar performance characteristics (see Figure 4). The EtherGate was a bit slower, and the GatorBox typically took twice as long as the Internet Router to get files to the server,

Performance differences became apparent as we added client/server pairs. Liaison kept pace exceptionally well, but the GatorBox handled increased traffic very erratically (see Figure 5). When four client/server pairs were slugging it out through the GatorBox, the slowest file transfer took nine times longer than the fastest. This means that a busy GatorBox may take between 2 and 18 minutes, for example, to transfer the same set of files between nodes. Many users will be puzzled — and annoyed — by such behavior.

# Confounded by the Configuration

It's great to have a fast router, but first you have to install it correctly, and router setup can be quite tricky. It's extremely easy for even a knowledgeable person to seriously mess up an existing internet. When this happens, users can't access their mail, printers, or critical data on file servers. They get angry — it's not a pretty sight.

Most AppleTalk network administrators have other duties and are elected to maintain the network "in their spare time," We asked a knowledgeable Macintosh and PC user to install each router in its simplest configuration for use as an Ethernet backbone. Our tester had had plenty of experience connecting printers and other serial devices to Macs and PCs but had never previously installed a router. Based on her ordeal, you should expect to expend some time and energy on initial setup.

The FastPath 4, with its voluminous documentation and unforgiving software, gets the lowest marks for setup ease. If you don't follow the manual closely, you'll get lost in the installation process. The on-line help is well designed, but it can't overcome the configuration software's deficiencies.

The EtherGate is somewhat easier to install, although the configuration software uses a Font/DA Mover-style interface that makes the task confusing. And the on-line "help" is irksome—it's loaded with marketing propaganda rather than useful information about the installation process.

Installing the GatorBox might be more understandable if you already know how to deal with TCP/IP networks. Actually, for basic EtherTalk-to-LocalTalk routing, you don't have to deal with TCP/IP, but you'd never know it from reading the manual. Another major shortcoming is that if the power fails, the GatorBox "forgets" its configuration information and must be reconfigured — hardly acceptable behavior from such a critical network resource. (The other routers automatically put themselves back into action after a power failure.)

Setup ease improves with the Internet Router. It's a relief to have familiar Apple documentation, although the software interface isn't much better than that of the other routers. It uses an odd-sized font that's not part of a minimum system, so the display is clunky. And the EtherTalk Phase 1 and Phase 2 icons are so small that it's hard to tell them apart.

Installing Liaison is a snap compared with installing the others, with an intuitive interface and easy-to-follow instructions. The manual is unimposing, and the on-line help does its job.

# Which Route to Take?

You can't compare these routers with each other on the basis of speed alone. Each has additional features that distinguish it from the others — support for other network protocols, security, dial-up modem access, number of networks supported. Before choosing a router, first think about your current internet and plan its evolution. If you picture a geographically dispersed internet, for example, with users telecommuting from their homes, make sure the router you buy can accommodate such a setup. Liaison and the EtherGate are the obvious choices for such a scenario.

In its most basic form, an EtherTalk-to-LocalTalk router lets you print to a LaserWriter from an EtherTalk network. If this is all you need in a router, perhaps a software solution that shares space with an AppleShare server is your best bet. Keep in mind that performance on the Macintosh running the router software may degrade for all other functions. But using a software router just for printing won't create too great a strain, and a software router such as the AppleTalk Internet Router or Liaison offers fast routing at an affordable price when run in the background.

Liaison and the AppleTalk Internet Router are also good choices for a first router. Install one of them on whichever server in your internet has the least traffic congestion, possibly your print or file server. Once it's installed, you can then determine whether you need to dedicate a Mac to this task or if you need a hardware router instead. Keep future expansion in mind; when you know what you want your internet to look like, it will be easier to choose the right router.

Kee Nethery, of Kagi Engineering in Berkeley, California, specializes in the design and optimization of complex AppleTalk networks. We would also like to thank Kirsten Malmquist, who suffered through the router installation procedures.

# The Bottom Line



Infosphere's Liaison gave the most consistent performance.

Since each of the routers we looked at offers a variety of features, it's difficult to single out the best one. "Best" means something very different to you if you need to connect to a UNIX machine on a university campus, for example, or if you're going to be storing files on a VAX. But based strictly on EtherTalk-to-LocalTalk routing capabilities, we can tell you which router provides fast performance at a reasonable price. Besides speed, you should also consider consistency. The amount of time it takes to route packets to the appropriate network shouldn't rise or fall dramatically with varying levels of activity on the internet. This being the case, let's point some fingers - or thumbs, that is - up or

Infosphere Liaison (\$295) comes out ahead in the price/performance equation. Only the AppleTalk Internet Router was faster, and Liaison had the most consistent file-transfer times as internet traffic increased. When run in the background of a server Mac. Liaison is also the least expensive. For this reason, we feel it's a good entry-level EtherTalk-to-LocalTalk router. It's also the easiest to get up and running, plus it has dial-up capabilities. If you only need to print to a LaserWriter from an Ethernet network, run Liaison in the background of your print or file server and see how well it performs. If you find that performance bogs down for both the router and the server, think about investing in a dedicated hardware router.



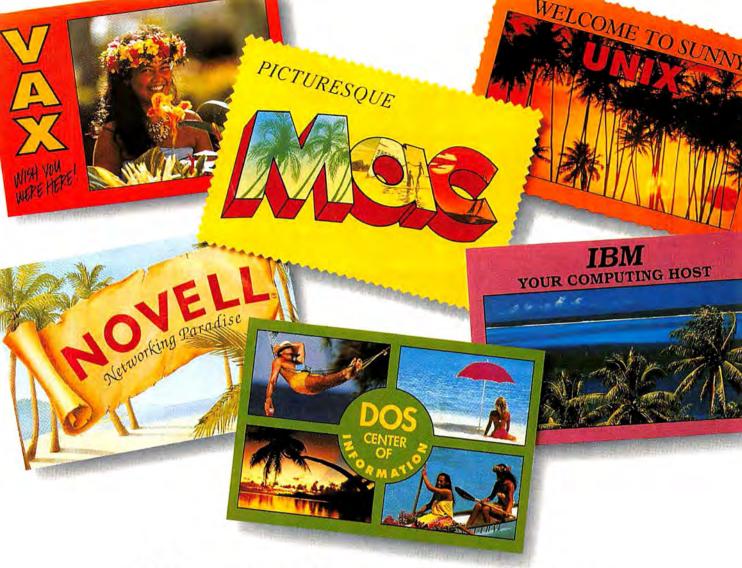
The Novell Kinetics FastPath 4 is our hardware router of choice.

For a fast, stable router that doesn't take up space or processing power on a Mac, we recommend the **Novell Kinetics Fast-Path 4** (\$2,795). Once you've figured out how to properly install a FastPath, it's a solid performer. It also provides low-level UNIX and DEC connectivity and many network-management features, such as the ability to selectively hide zones. Laser-Writers, and other Chooser-selectable resources.

In terms of raw speed, Apple's Apple-Talk Internet Router (\$399) is the fastest router we tested. If you have all six slots of a Mac II, IIx, or IIfx available, you can build a large internet of several EtherTalk, Local-Talk, and even TokenTalk networks. (We recommend leaving one slot open for a video card.) Like Liaison, the Internet Router looks inexpensive, but if you dedicate a Mac to the routing task, it quickly becomes pricey.

The Shiva EtherGate (\$2,399) is a good choice if you need dial-in capability for DOS users or if you want to tap into the power of its serial ports and construct a geographically distributed internet.

Finally, we don't recommend using the Cayman GatorBox (\$2,795) as an Ether-Talk-to-LocalTalk router. Not only was it the slowest router we tested, but the response time was also unpredictable. In its favor, however, the GatorBox has many add-on software modules that make it a full-featured, high-level gateway to other network protocols.



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For network solutions, you should be seeing red.

# Products

This buyer's quide includes hardware and software for local-area networks. It excludes database and telecommunications products as well as software for terminal emulation other than the 3270. Mailing addresses and phone numbers are at the end of the guide.

# **Cabling and Cabling Hardware**

# Cabling and Connectors

**Apple Computer:** 

AppleTalk Custom Wiring Kit, \$849 LocalTalk Locking Cable Kit, \$75 LocalTalk Locking Connector Kit DIN-8, \$75

LAN One AppleTalk Communications Card (internal NuBus converter), \$595 LAN One AppleTalk Converter (external).

LAN One AppleTalk Extender, \$285

Farallon:

PhoneNET Connector, \$75; 10-pack, \$395 PhoneNET PLUS (DIN-8), \$59.95 PhoneNET PLUS (DB-9), \$59.95 PhoneNET-to-LocalTalk adapter cable, \$9.95 PhoneNET twisted-pair cable, 500-foot roll, \$100

RJ-11 Modular Extension Cable, 14 feet, \$5; 25 feet, \$7

**Nuvotech:** 

TurboNet, \$49.95 TurboNet ST, \$59.95

Photonics:

Photolink (infrared LocalTalk), \$1,195 (minimum of two units required) Adapter kit for LocalTalk cabling, \$29

# LocalTalk Transceivers (for PCs)

**Apple Computer:** 

LocalTalk PC Card with AppleShare version 2.0. \$299

Dayna Communications:

DaynaTALK PC card, \$299; 4-pack, \$1,099 DaynaTALK MC card, \$399; 4-pack, \$1,399

**DayStar Digital:** 

LT200MC, \$395 LT200PC, \$249

Information Presentation

Technologies: 230/A LocalTalk Interface Card (UNIX to Mac), \$495

FlashTalk card for PC, \$239

 Enhanced LocalTalk Transceivers (for Macs)

**Dayna Communications:** 

DaynaTALK, \$139; 5-pack, \$549 SpeedGuard Collision Filter, \$69.95

TOPS:

FlashBox, \$189

## Ethernet Transceivers

Adaptec:

Nodem for thin Ethernet, \$595 Nodem for thick Ethernet, \$545 Nodem for twisted-pair phone wire, \$645

Apple Computer: Macintosh II EtherTalk NB Card, \$699

Asanté:

MacConllE, \$595 MacConlIETP, \$695 MacConIITRN, \$695 MacConlITRL, \$795 MacCon30E, \$595 MacCon30ETP, \$695 MacConSEE, \$395 MacConSEETK, \$395 MacConSEETP, \$495

Cayman Systems

GatorCard E/II, \$595 GatorCard E/SE, \$595 GatorCard E/SE/30, \$595

Compatible Systems:

Ether+, \$495 Ether2, \$395

FastNET LAN 020, \$1,499 to \$2,431 FastNET SCSI, \$1,249 FastNET SE, \$599 FastNET SE/30, \$599 FastNET III. \$599

SpeedLink/SE, \$549 SpeedLink/30, \$549 SpeedLink II, \$549 SpeedTalk driver software, \$149

**Network Resources:** 

Mac2000 (on-board 68000), \$995

NetWorth:

EtherNext, \$725

Novell:

EtherPort SE, \$595 EtherPort II, \$595 EtherPort SE/30L, \$645 EtherPort SEL, \$645 EtherPort IIL, \$645

Nuvotech: NuvoLink II, \$395\* NuvoLink SC, \$495

Racal InterLan:

MacConnect NIA310 NB (coax), \$549 MacConnect 10BT (twisted pair), \$625

3Com:

EtherLink/NB Card, \$595 EtherLink/SE Card, \$595

### Token-Ring Transceivers

Apple Computer:

Apple TokenTalk NB Card, \$1,250

h-three Systems:

MacRing NB, \$895 MacRing SE, S795

MacRing SE/30, \$895\*

Tri-Data Systems:

LanWay TR 16/4, \$1,095 LanWay TR 16/4 SE/30 adapter card, \$1,095

### Other Transceivers

Northern Telecom:

Meridian LANSTAR for AppleTalk, \$700 to \$800

### ·Hubs

David Systems:

David ExpressNet (Ethernet), \$2,495 (12 ports) to \$21,700 (132 ports) David VolksNet, \$1,199 (no networkmanagement utility)

Du Pont:

LAN One Universal Concentrator, (fiber optics: can use LocalTalk Ethernet and token ring simultaneously), from \$220 per node for 34 nodes

PhoneNET StarController (LocalTalk), \$1,295 PhoneNET StarController EN (Ethernet). \$2,495 PhoneNET StarConnector, \$29.95; 10-pack, \$249 PhoneNET StarConnector EN, \$195 StarController Wiring Kit (RJ-11 Harmonica Block), \$95 StarController Wiring Kit (Punchdown Block), \$95 StarController Wiring Kit (RJ-11 Patch Panel), \$395

NetWorth:

EtherNext Concentrator (Ethernet), \$2,495

Nuvotech:

TurboStar (LocalTalk), \$1,795

SynOptics Communications: Series 1000 (Ethernet, 20 to 200 users),

\$300 per connection Series 2000 (Ethernet, 4 to 40 users), \$150

per connection System 3000 (token ring and Ethernet in same wiring, 75 or more users), \$350 to 500 per node\*

Routers and Repeaters

Apple Computer:

AppleTalk Internet Router, \$399

Cayman Systems:

GatorBox (router and TCP/IP gateway), GatorShare software (translates between AFP and NFS), \$1,995 GatorMail (translates Mac and UNIX mail), \$995 for 10 users GatorPrint (AppleTalk to UNIX), \$595\*

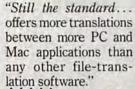
**Engage Communication:** 

SyncRouter (for WANs), \$1,895

Farallon:

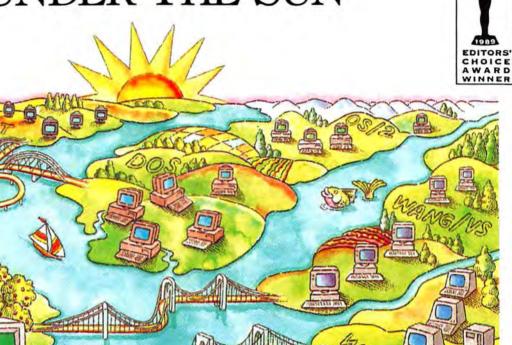
PhoneNET Repeater, \$495

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MacUser



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\*takes advantage of special connections built into MacWrite\* II from Claris™

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# Mac Ser

# **Hayes Microcomputer Products:**

InterBridge, \$799

Infosphere:

Liaison, \$295

Network Resources: AT2000-E, \$1,195 AT2002-E, \$1,395 LT2000E, \$2,395

Novell:

FastPath 4, \$2,795

**Nuvotech:** 

TurboBridge, \$499

EtherGate, \$2,399 NetBridge, \$499

Solana Electronics:

Solana C-Server, \$695 Solana I-Server, \$695

SynOptics Communications:

3323 Local Bridge, \$4,195

TOPS:

TOPS Repeater, \$189

Wollongong: MacGateWay AT router, \$2,295

# Mainframe Connections and Gateways

**Apple Computer:** 

Apple Coax/Twinax Card with MacDFT. \$1,495 MacDFT software, \$245

MacX25, \$800

Avatar:

MacMainFrame II, \$995 MacMainFrame II/DFT, \$1,295; DFT upgrade, \$495

MacMainFrame Coax Gateway, \$2,495 MacMainFrameDX, \$1,195 MacMainFrame Graphics, \$195\* MacMainFrame SDLC Gateway, 8 sessions, \$2,495; 32 sessions, \$4,495; 64 sessions, \$6,495

MacMainFrame SDLC Workstation, 8 sessions, \$1,295° MacMainFrame SE, \$795 MacMainFrame SE/30, \$995 MacMainFrame SE/30/DFT, \$1,295; DFT

upgrade, \$495 MacMainFrame Token Ring Gateway, 8 users, \$2,495; 32 users, \$4,495; 64 users, \$6,495

MacMainFrame Token Ring Workstation, \$1,295; software, \$395\*

**Digital Communications Associates:** 

MacIRMA SE, SE/30, and II, \$1,195 MacIRMA API, \$195 MacIRMA Graphics, \$1,295 MacIRMALAN 802.2 Gateway Server (for token ring), 16 sessions, \$3,995; 64 sessions, \$5,995 MacIRMALAN SDLC Gateway Server, 16 sessions, \$4,495; 64 sessions, \$6,495

MacIRMA Workstation, \$1,395

Net/One MacUWS (TCP/IP), \$203 to \$350 per user, depending on number of users; administrator's kit. \$395

LAN WorkPlace for Macintosh, \$250

Simware:

Mac3270 Async, \$250 Mac3270 Master, \$325 SIM3278 mainframe software, \$10,000 to \$20,000

Solana Electronics:

Solana H-Server (ISDN gateway), \$2,195 Solana R-Server, \$595

Spectrum Concepts:

XCOM 6.2 for the Mac, \$495

Tri-Data:

Netway 1000, 16 users, \$3,995 Netway 2000, 64 users, \$9,995 Ethernet adapter, \$2,795 token-ring adapter, \$3,695

Wollongong:

MacPathWay Access (TCP/IP for Mac, VT, and 3270 emulation), \$179 to \$275

### Server Software

# Distributed File Servers

Information Presentation Technologies

Personal Server Network, 1 user, \$149; 4 users, \$529; 10 users, \$999

International Business Software:

DataClub Unified File Server, \$249 DataClub Security (adds AFP privileges).

AFP Security DataClub PC Gateway (gives PCs access), \$499\*

**Newbridge Networks:** 

PC ♥ Mac, 16 Macs and 16 PCs, \$350 Package of software and MainStreet datacontroller cables and connectors, \$995

ShirtPocket Software:

EasyShare (supports 10 Macs), \$150

TOPS Network Bundle for Macintosh, \$299

# Dedicated File Servers

Alisa Systems:

AlisaTalk, \$4,700 to \$14,000 per VAX CPU Alisa TSSnet, \$495 per Mac.

**Apple Computer:** 

AppleShare File Server, \$799 AppleShare PC 2.0, \$149

Dayna Communications:

DaynaNET, \$795 to \$3,995

Information Presentation Technologies:

uShare (AppleShare-type server for UNIX machines), UNIX software, \$1,195 to \$1,675; \$150 per Mac

Infosphere:

MacServe (disk server), \$250

Miramar Systems:

MacLan Connect, \$995

NetWare 2.15 for Macintosh, 4 users, \$695; 100 users, \$4,995

Pacer Software:

PacerLink, 5 users, \$2,000; 500 users, \$37,500 PacerShare (for VAX), 5 users, \$400; 500 users, \$7,500 PacerTOPS (VAX server for TOPS users), 5 users, \$400; 500 users, \$7,500

3Com:

3+Open LAN Manager (OS/2 server). 5 users, \$995; 10 users, \$1,495; unlimited users, \$3,395 3+Open LAN Manager 2.0, \$5,995 (expected in July) 3+Share (DOS server), 5 users, \$595; unlimited users, \$2,995

# Print Services

Alisa Systems: Alisa DEC Printer Support, \$750 to \$2,300 per VAX CPU

**Apple Computer:** 

AppleShare Print Server, \$299

Pacer Software:

PacerPrint, \$1,000 to \$4,000 (depending on VAX host)

# •Electronic Mail

cc:Mail

cc:Mail LAN, 25 users, \$695 cc:Mail LAN for Macintosh module, \$495 cc:Mail LAN Expand, 25 to 100 users, \$595

**CE Software:** 

QuickMail, \$189.95; 5 users, \$339.95; 10 users, \$499.95; each additional user,

Dayna Communications: DaynaMail, 5 users, \$295

Microsoft Mail, server package, \$395; 1-to-4-user workstation package, \$125

Pacer Software:

PacerPost (VAX-based), \$2,000 to \$8,000

RetixMail for Macintosh, 10 users, \$445; 50 users, \$1,650°

3Com:

3+Mail for Macintosh, server license, 1 to 5 users, \$595; unlimited users, \$1,190

InBox, free with TOPS; 20 users, \$329 InBox Plus, 100 users, \$995

Mail Center, 2 users, \$299; 6 users, \$499

<sup>\*</sup>These products were not shipping at press time (mid-March) but were expected to be available by June.



# Finally, The PC Compatible You've Always Wanted.

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Liaison—recipient of the 1989 Eddy for Best New Networking Product and the only five mouse network product review, "Robust security... Works every time... A brilliant piece of programming... Look to Liaison first." MacUser, April 1989



# ACUSE Guide to Network Products, continued

# Server Hardware

# Jasmine Technologies:

DirectServe, \$1,795
DirectServe with 130-megabyte hard-disk drive, \$2,699
DirectServe with 180-megabyte hard-disk drive, \$2,999
DirectServe with 300-megabyte hard-disk drive, \$4,299

### **Practical Peripherals:**

P/NET (allows sharing of serial and parallel devices; includes server software), 4 Macs, \$1,695; each additional Mac, \$189

### Samsung Information Systems America:

Samsung/Novell 386AE, \$3,999
Samsung 386A3 (both models for both
Novell NetWare and 3Com 3+Open), \$6,499

### Shiva:

NetSerial (allows serial printers and other serial devices to be shared on a network), \$399

# **Software Utilities**

## **Apple Computer:**

InterPoll Network Administrator's Utility, \$129

# **Beagle Bros:**

Flash (file passing), \$199.95 per network zone

# **Compatible Systems:**

QuickShare (allows Macs to access PC drives on a network), \$465

## **Dynamic Microprocessor Associates:**

pcMACTERM/Network (provides network remote control of PC from Mac), \$395

# Farallon:

CheckNET, \$95
TrafficWatch, \$195
Timbuktu 3.0 (provides remote control of Mac over network, file passing), \$149
Timbuktu 30-Pack, \$1,995
Timbuktu/Remote, \$195
Timbuktu/Remote Access Pack, \$1,295

# Integrated Solutions:

Central System Manager 2 (VAX management from Mac), \$900 to \$40,000 depending on size of VAX

## LaCie:

Silver Server (disk sharing), \$149.95

# Microcom:

Carbon Copy Mac (network remote control of Mac), 1 user, \$199; 2 users, \$299\*

### Olduvai:

ClipShare (allows 10 users to share Clipboards over a network), \$295

## COMPANY ADDRESSES

### Adaptec

691 S. Milpitas Blvd. Milpitas, CA 95035 (408) 945-8600

# Alisa Systems, Inc.

221 E. Walnut St., #175 Pasadena, CA 91101 (818) 792-9474

# Apple Computer, Inc.

20525 Mariani Ave. Cupertino, CA 95014 (800) 538-9696 (for information on authorized Apple dealers) (408) 996-1010

### Asanté

405 Tasman Drive Sunnyvale, CA 94089 (800) 662-9686 (408) 734-4844

### Avatar

65 South St. Hopkinton, MA 01748 (508) 435-3000

# Beagle Bros

6215 Ferris Square, Suite 100 San Diego, CA 92121 (619) 452-5500

# Cayman Systems

26 Landsdowne St. Cambridge, MA 02139 (617) 494-1999

# cc:Mail, Inc.

2141 Landings Drive Mountain View, CA 94043 (415) 961-8800

# **CE Software**

801 73rd St. Des Moines, IA 50312 (800) 523-7638

# Compatible Systems Corp.

P.O. Drawer 17220 2900 Center Green Court S. Boulder, CO 80308 (800) 356-0283 (303) 444-9532

# **David Systems**

701 E. Evelyn Ave. Sunnyvale, CA 94086 (408) 720-6867

# Dayna Communications

50 S. Main St., Fifth Floor Salt Lake City, UT 84144 (801) 531-0600

# **DayStar Digital**

5556 Atlanta Highway Flowery Branch, GA 30542 (800) 962-2077 (404) 967-2077

# **Digital Communications Associates**

1000 Alderman Drive Alpharetta, GA 30201 (404) 442-4522

# Dove Computer Corp.

1200 N. 23rd St. Wilmington, NC 28405 (800) 622-7627 (919) 763-7918

# **Du Pont Electro-Optic Products**

P.O. Box 13625 Research Triangle Park, NC 27709 (800) 888-5261 (919) 481-5100

# Dynamic Microprocessor Associates, Inc.

60 E. 42nd St., Suite 1100 New York, NY 10165 (212) 687-7115

# EMAC, a division of Everex

48431 Milmont Drive Fremont, CA 94538 (800) 3821-0806, ext. 2222 (415) 498-1111

# Engage Communication, Inc.

756 Marlin, #4 Foster City, CA 94404 (415) 358-0264

# **Farallon Computing**

2000 Powell St., Suite 600 Erneryville, CA 94608 (415) 596-9100

# h-three Systems Corp.

100 Park Drive, Suite 204 P.O. Box 12557 Research Triangle Park, NC 27709 (919) 549-8334

# Hayes Microcomputer Products, Inc.

P.O. Box 105203 Atlanta, GA 30348 (404) 441-1617

<sup>\*</sup>These products were not shipping at press time (mid-March) but were expected to be available by June.

# BERNOULLI DRIVES THE HOTTEST ISSUES IN DESKTOP PUBLISHING.

"Since a color TIFF image can eat seven or eight megabytes, the need for alternative storage devices is growing rapidly in desktop publishing."

For Scott Campbell, the art director of *Aldus Magazine*, desktop publishing is



serious business. Because when you produce a magazine for the world leader in desktop publishing, you

have to do it right. So Campbell relies on the proven expert in removable storage. Bernoulli.®

"Aldus Magazine is no ordinary publication," says Campbell. "Its design and production are a lab for over 200,000

Aldus® customers. We use our software to redesign each issue, and with the

amount of data we handle.

Bernoulli really simplifies the process."

Bernoulli is a complete primary storage solution for desktop publishing. Its removable 44MB disks provide endless

storage capacity, without the worry of filling up a hard disk.

And Bernoulli works the way you work, giving you total flexibility in data storage and transfer. It

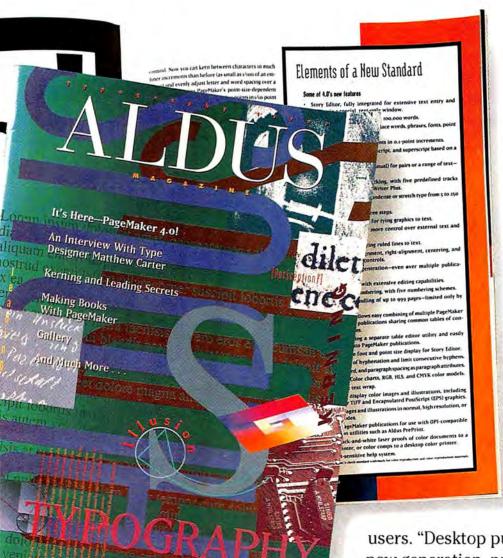
allows you to keep both your files and application on one 44MB disk. So transferring large projects to service

bureaus is as simple as sending the disk over, eliminating software compatibility problems and saving the time of using a modem. And since Bernoulli disks can withstand 1000Gs of shock, they're

rugged enough to mail anywhere.

"Sending huge amounts of data to service bureaus demands a portable, high-density medium,"





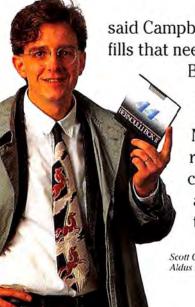


deliver hard disk performance without the risks.

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said Campbell. "Bernoulli fills that need for us."

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Scott Campbell, Art Director, Aldus Magazine, Aldus Corporation



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# ACCISE Guide to Network Products, continued

# Information Presentation Technologies,

5000 N. Parkway Calabasas Road Suite 304 Calabasas, CA 91302 (800) 233-9993 (818) 347-7791

Infosphere, Inc. 4730 S.W. Macadam Ave. Portland, OR 97201 (800) 445-7085 (503) 226-3515

Integrated Solutions, Inc. 1020 Ace Ave. King of Prussia, PA 19406 (215) 337-2282

International Business Software, Inc. 1230 Oakmead Parkway, Suite 310 Sunnyvale, CA 94088 (800) 733-2822 (408) 720-0170

Jasmine Technologies 1740 Army St. San Francisco, CA 94124 (415) 282-1111

LaCie, Ltd. 16285 S.W. 85th St., Building 306 Tigard, OR 97224 (800) 999-0143 (503) 684-0143

Microcom, Inc. Software Division 55 Federal Road Danbury CT 06810 (617) 551-1999

Microsoft Corp. 1 Microsoft Way Redmond, WA 98052-6399 (800) 426-9400 (206) 882-8080

Miramar Systems 201 N. Salsipuedes, Suite 205 Santa Barbara, CA 93103 (805) 965-5161

Network Resources Corp. 2450 Autumn Vale Drive San Jose, CA 95131 (408) 263-8100

NetWorth, Inc. 8101 Ridgepoint Drive, Suite 107 Irving, TX 75063 (800) 544-5255 (214) 869-1331 Newbridge Networks, Inc. 13873 Park Center Road Herndon, VA 20271 (703) 834-3600

Northern Telecom 2435 N. Central Expressway Richardson, TX 75080 (800) 328-8800 (214) 301-2000

Novell 122 E. 1700 S. Provo, UT 84606 (800) 526-5463 (801) 379-5900

Nuvotech 2015 Bridgeway, Suite 204 Sausalito, CA 94965 (800) 232-9922 (415) 331-7815

Olduvai 7520 Red Road, Suite A South Miami, FL 33143 (800) 822-0772 (305) 665-4665

Pacer Software, Inc. 7911 Herschel Ave., #402 La Jolla, CA 92037 (619) 454-0565 (East Coast) (508) 898-3300 (West Coast)

Photonics Corp. 200 E. Hacienda Ave. Campbell, CA 95008 (408) 370-3033

Practical Peripherals 31245 La Baya Drive Westlake Village, CA 91362 (800) 442-4774 (818) 706-0333

Racal InterLan 155 Swanson Road Boxborough, MA 01719 (508) 263-9929

Retix 2644 30th St. Santa Monica, CA 90405 (213) 399-2200

Samsung Information Systems America, Inc. 3655 N. First St. San Jose, CA 95134 (800) 446-0262 (408) 434-5400 ShirtPocket Software P.O. Box 40666 Mesa, AZ 85274 (602) 966-7667

Shiva Corp. 155 Second St. Cambridge, MA 02141 (800) 458-3550 (617) 864-8500

Simware, Inc. 20 Colonnade Road Ottawa, Ontario K2E 7M6 Canada (613) 727-1779

Solana Electronics 7124 Convoy Court San Diego, CA 92111 (619) 573-0800

Spectrum Concepts 150 Broadway, Suite 814 New York, NY 10038 (212) 766-4400

SynOptics Communications 501 E. Middlefield Road Mountain View, CA 94043 (415) 960-1100

3Com Corp. 3165 Kifer Road Santa Clara, CA 95052 (800) 638-3266 (408) 562-6400

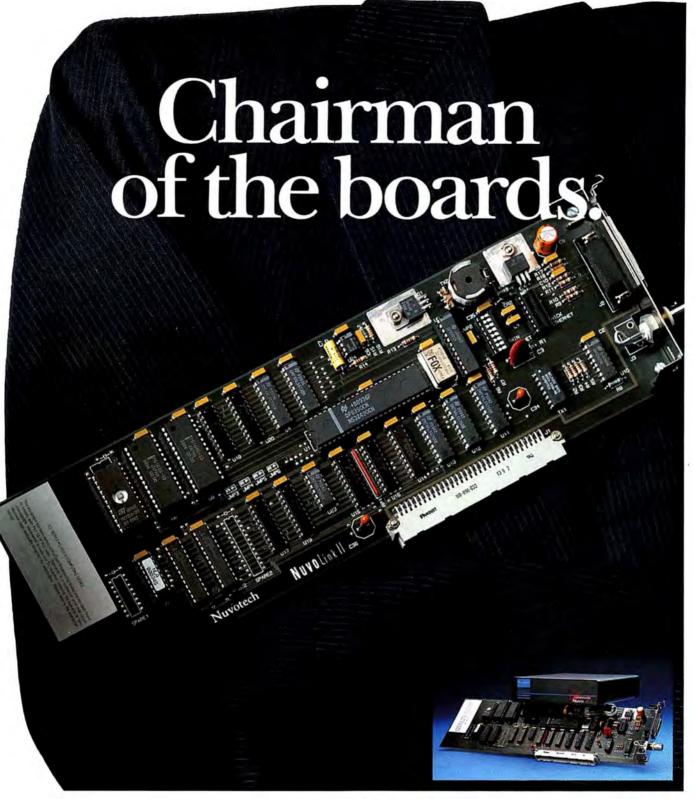
**TOPS**950 Marina Village Parkway
Alameda, CA 94501
(800) 445-8677
(415) 769-9669

Tri-Data Systems, Inc. 3270 Scott Blvd. Santa Clara, CA 95054 (408) 727-3270

Ungermann-Bass, Inc. 1731 Technology Drive, Suite 700 San Jose, CA 95110 (408) 496-0111

Videx, Inc. 1105 N.E. Circle Blvd. Corvallis, OR 97330 (503) 758-0521

Wollongong Group 1129 San Antonio Road Palo Alto, CA 94303 (415) 962-7200



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# PLI gives you "Connectivity Through Storage" for Mac, A/UX, DOS, UNIX and more!

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# The Infinity Optical 650MB Removable Connectivity

The Infinity Optical will bring state-of-the-art data storage to your office. High-capacity, removable storage with access times down to 28ms and media warranties of up to 25 years are complemented by multi-platform compatibility. And, just like the Infinity 40, you can use DOS

cartridges and data on your Mac.



# The TurboFloppy 1.4 Floppy Disk Connectivity

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# MINIFINDER

elcome to MiniFinders, your personal quarterly buyer's guide. We've organized the listings so you can easily find the products you're interested in. MacUser editors carefully select and evaluate every product with ratings from one to five mice, in half-mouse increments. All the ratings are relative within a category, and because the market is constantly changing, our ratings change too. We've indicated all our Eddy (Editor's Choice) Award winners with a \*, along with the year they were recognized for their excellence. And this is only a sample of what's available. A HyperCard version, with more than 400 MiniFinders, is available on CompuServe. Just enter GO MACUSER at any "!" prompt and follow the directions for downloading.

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# COMMUNICATIONS

# · CONNECTIVITY

DaynaFile tttt

DaynaFile is a drive that reads 3.5- or 5.25-inch DOS floppy disks. The drive connects to a Mac SCSI port and appears on the desktop. Version 3.1 (drive), version 2.3 (INIT). Requires System 3.2 or later. DF0104 Dual 3.5-/5.25-inch, \$1,005; single drives start at \$650; MacLinkPlus/Dayna, \$125; DOS Mounter (for use with Apple FDHD drives), \$89. Dayna Communications, 50 S. Main St., Fifth Floor, Salt Lake City, UT 84144. (801) 531-0600. (Oct '89) ★'87 Eddy

MacLinkPlus/PC \$\$\$\$\$

MacLinkPlus/PC offers more translations between more PC and Mac applications than does any other application. Interface is friendly, and translations are clean. In addition to translating locally or over a network, the package can connect to a PC serially and via modem. Translators work with Apple File Exchange, Version 4.1. MacLinkPlus/PC (with tele-communications), \$199; Mac-LinkPlus/Translators (desktop version only), \$159; MacLink-Plus/WangVS and MacLink-Plus/ WangOIS, \$395 to \$895. DataViz, 35 Corporate Drive, Trumbull, CT 06611. (203) 268-0030. (Oct '89)

Oracle for Macintosh tttt

Oracle for Macintosh is more a development tool kit than an end-user product. It allows the creation of Mac front-end applications that access Oracle databases on mainframes and minis. Includes HyperCard XCMDs. Version 1.1. Singleuser, \$299; network version, \$999. Oracle, 20 Davis Drive, Belmont, CA 94002. (800) 345-3267, (415) 637-0800. (June '89)

# • NETWORKING

AppleShare \$\$\$\$

AppleShare is Apple's own file server. Software-based Apple-Share lets network users protect files from other users on the folder level. Version 2.01. Requires a dedicated Mac and a hard-disk drive. \$799; AppleShare Print Server, version 2.0, \$299; AppleShare PC, version 2.0, \$149. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '87)

Liaison tttt Liaison is a software-based AppleTalk bridge for connecting two LocalTalk networks or a LocalTalk and an EtherTalk network. Using Liaison with standard modems, users can connect remotely to an Apple-Talk network, or two networks can be connected to form a wide-area network. Serialized. Version 2.06. \$295. Infosphere, 4730 S.W. Macadam Ave., Portland, OR 97201. (800) 445-7085. (503) 226-3515. (April

'89) \* '88 Eddy **NetWare for** 

Macintosh \$\$\$ NetWare for Macintosh allows Macs on LocalTalk or Ethernet networks to connect to a NetWare file server using AppleShare client software. Difficult PC-based setup and administration. Not recommended for Macintosh-only networks. For users with non-AppleTalk PC networks that are already attached to Net-Ware servers: 4 mice. Version 1.1. Requires 80286- or 80386based PC for server, PC for administration, PC LocalTalk card, two PC Ethernet cards, NetWare version 3.15 or later, and AppleShare client soft-ware. \$200. Novell, 122 E. 1700 S., Provo, UT 84606. (800) 526-5463. (Sept '89) ★'88 Eddy

TOPS \$\$\$\$%

TOPS is a file server designed to network computers with different operating systems. Supports Macs, MS-DOS compatibles, and UNIX machines. Access to files and subdirectories is transparent to users; they appear as Mac folders. Handles only ASCII or text files. Serialized. Version 3.0. \$249. TOPS, 950 Marina Village Parkway, Alameda, CA 94501. (800) 445-8677. (May '87) \*'87 Eddy

# TELECOMMUNICATIONS

MicroPhone II tttt/2

MicroPhone II is a high-powered terminal program that's easy enough for novices. Very powerful command language allows full automation of communications. Version 3.0. Requires Mac Plus or later. \$295. Software Ventures, 2907 Claremont Ave., Suite 220, Berkeley, CA 94705. (415) 644-3232. (Jan '89) \* '86 Eddy

Smartcom II ttttt Smartcom II balances power and ease of use. It's capable of unattended operation and has a powerful command language. The fastest screen updating available can keep up even at 9,600 bps. The large-screen buffer can easily be archived. Version 3.IC. \$149. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan '89) \*'85 Eddy

# DATABASES

DAtabase \$\$\$\$%

DAtabase is a flat-file manager in a DA. Handles pictures, text, and numbers. Imports QuickDEX and other files. Version 1.5. Requires Mac 512K or later, \$129.95. Preferred Publishers, 5100 Poplar Ave., Suite 706, Memphis, TN 38137. (800) 423-0276, (901) 683-3383. (Jan '90)

Double Helix II tttt

Double Helix II is a relational database that works in a multiuser environment. Uses an icon-based development system for easy creation of databases. Version 3.0. \$595. Odesta Corp., 4084 Commercial Ave., Northbrook, IL 60062. (800) 323-5423. (Apr '88)

FileMaker II tttt/2 FileMaker II is a solid flat-file manager with multiuser capability that is ideal for businesses. Has flexible layouts and good searching, data entry, and reporting capabilities. Version 1.1. Requires Mac Plus or later and two 800K drives or a harddisk drive. \$299. Claris Corp., 5201 Patrick Henry Drive.



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# MINIFINDERS

Santa Clara, CA 95052. (408) 987-7000. (Nov '89) Filevision IV \$\$\$ 

Filevision IV is a pictureoriented flat-file manager. Still the application of choice for graphics/text integration projects. Doesn't stack up well in straight-text uses. Version 1.0.6. Requires Mac Plus or later. \$495. Marvelin, 3420 Ocean Park Blvd., Suite 3020, Santa Monica, CA 90405. (213) 450-6813. (Nov '89)

4th Dimension \$555

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4th Dimension is a versatile relational database that can create stand-alone applications. Has a Pascal-like procedural language. Design and layout environments allow easy information linking. New version is faster, more robust. Version 2.0.10. Requires Mac Plus or later. \$695. ACIUS, 10351 Bubb Road, Cupertino, CA 95014. (408) 252-4444, ext. 5. (Feb '90) ★ '87, '89 Eddy

FoxBASE+/Mac \$\$\$\$% FoxBASE+/Mac is a relational database that can read unmodified dBASE III PLUS applications. Amazingly fast. Good implementation of dBASE on the Macintosh. Version 2.0. Requires Mac Plus or later. \$495; multiuser version, \$695. Fox Software, 134 W. South Boundary, Perrysburg, OH 43551. (419) 874-0162. (Sept '88) \*88 Eddy

Omnis 5 tttt1/2

Omnis 5 is Blyth's major up-grade of Omnis 3. Primarily a developer's tool, it's a powerful, graphics-oriented, multiuser relational/hierarchical database. Improved interface still isn't entirely Mac-like. Comes with HyperCard externals for creating HyperCard front ends. Version 1.1. Requires Mac Plus or later and hard-disk drive. \$695. Blyth Software, 1065 E. Hillsdale Blvd., #300, Foster City, CA 94404. (800) 223-8050. (Sept '89)

Panorama \$\$\$\$\%

Panorama is a very powerful and classy flat-file manager. Keeps databases in RAM for speed. Spreadsheetlike data entry. Supports text, numbers, graphics, and dates as data types. Also offers powerful charting functions and macros. Version 1.5. Requires Mac Plus or later. \$395. ProVUE Development, 15180 Transistor Lane, Huntington Beach, CA 92649. (714) 892-8199. (Nov '89) \* '88 Eddy



# FONTS AND TYPOGRAPHY

Adobe Type Manager 1111 Adobe Type Manager makes your fonts better almost magically. It creates smooth screenfont images of any size and improves output of most Quick-Draw printers. Not quite perfect (has some problems with Word and smaller point sizes) and slow on 68000 Macintoshes; but, improvement in quality is usually worth the effort. Version 1.2. Requires Mac Plus or later. \$99 (includes Times, Helvetica, Courier, and Symbol fonts); other fonts additional. Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (800) 447-3577. (Feb '90) \* '89 Eddy

The Art Importer tttt

The Art Importer creates Post-Script fonts containing up to 256 graphic characters. Accepts logos, clip art, and PICT and EPSF graphics. As fonts, graphics can be used in programs that don't normally accept them, and resizing is as easy as changing the point size. Supports any color art. Mathcoprocessor version available. Version 2.0. Requires Mac Plus or later. \$179. Altsys Corp., 720 Ave. F, Suite 109, Plano, TX 75074. (214) 424-4888. (Apr '90) FONTastic Plus \$\$\$\$%

FONTastic Plus lets you customize and create bit-mapped fonts. It's easy to add or modify characters. Version 2.01 edits larger fonts and supports NFNTs. Version 2.02. Requires Mac 512K or later. \$99.95. Altsys Corp., 720 Ave. F, Suite 109, Plano, TX 75074. (214) 424-4888. (May '89)

Fontographer 3.0 tttt

Fontographer 3.0 is an upgrade of the top PostScript-font editor/generator. New features include an integrated screenfont editor, auto-tracing, and a pen tool. This is a professional tool that also includes Post-Script "hints" within your fonts. Screen-font editor automatically generates bit-mapped fonts but is strictly bare bones. Can also be used for creating logos but needs better drawing tools for this purpose. Version 3.0. Requires Mac Plus or later and System 4.2 or later. \$495. Altsys, 720 Ave. F, Suite 109, Plano, TX 75074. (214) 424-4888. (Jan '90)

LetraStudio \$\$\$\$

LetraStudio is a type-customization program for creating headlines, logos, signs, and other display type. Predefined envelopes let you create unique distortion effects. Works only with LetraFonts, which are accessible only through the program. Version 1.5. Requires Mac Plus or later and a harddisk drive. \$495; \$75 per font. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. (201) 845-6100. (May '89) ★'88 Eddy

TypeAlign for ATM ttt% TypeAlign for ATM is the first utility specifically designed for use with Adobe Type Manager. Lets you place text along circular, angled, or freehand paths. Font size is limited to between 9 and 144 points. Supports limited gray fills. Can export its effects in EPSF, PICT, or Illustrator formats. Version 1.0.2. Requires Mac Plus, System 6.0.2, and ATM. Adobe Systems, 585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (415) 961-4400. (May

# PAGE LAYOUT

'89) \*'89 Eddy

PageMaker \$\$\$\$\$

PageMaker gives designers complete freedom over page layout. Uses pasteboard metaphor. All placement of text and graphics relies on hand-eye coordination. Color Extension add-on lets you edit a color image's CMYK values. Can't do four-color separations. Easy to learn. Version 3.02. Requires Mac Plus or later and a harddisk drive. \$595; Color Extension available. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (206) 622-5500. (Jan '90). \* '85, '87, '88 Eddy

Publish It! \$\$\$\$
Publish It! is a moderately priced page-layout package designed for users with Pluses and SEs. Includes word-processing and simple drawing and painting tools. Works using a frame metaphor. Can rotate text. Limited color support. Version 1.1. Requires Mac 512KE or later and System 4.2 or later; System 6.0 or later preferred. \$495. Timeworks, 444 Lake Cook Road, Deerfield, IL 60015-4919. (708) 948-9200. (Dec '89)

QuarkXPress \$\$\$\$%

QuarkXPress is a powerful page-layout program with 24bit color, style sheets, and search-and-replace on text attributes. Also does four-color separations. Page layout is handled through text and graphics boxes that add precision to layout but are difficult to master. Version 2.12. Requires Mac Plus and hard-disk drive. \$795. Quark, 300 S. Jackson St., Suite 100, Denver, CO 80209. (303) 934-0784. CP until registered. (Jan '90)

Ready, Set, Go! 1111/2

Ready, Set, Go! combines an elegant interface with style sheets, fine-tuned typography, gray-scale editing, and spot color. The only program that provides thumbnail views so you can rearrange pages. It's one of the first programs to store font information with documents, thus avoiding font-ID conflicts. Version 4.5a. Requires Mac Plus and a harddisk drive, \$495, Letraset USA. 40 Eisenhower Drive, Paramus, NJ 07653. (201) 845-6100. (Jan '90).

Springboard Publisher ### Springboard Publisher combines page-layout, word-processing, and graphics capabilities in an easy-to-learn program. Too limited for serious DTP but cost-effective for simple documents. Version 1.06. Requires Mac Plus or later. \$199.95. Spinnaker Software Corp., One Kendall Square, Cambridge, MA 02139. (800) 826-0706. (May '89)

# PRESENTATIONS

**CA-Cricket Presents 1111** 

CA-Cricket Presents is a presentation tool with a strong graphics emphasis. Good master template. Lacks import capability for text. Version 2.0. Requires System 4.2 or later. \$495. Computer Associates, 10505 Sorrento Valley Road, San Diego, CA 92121-1698. (800) 531-5236. (Dec '88)

Persuasion tttt

Persuasion is an outstanding presentation tool with an excellent drawing environment. Its extensive AutoTemplates. color schemes, and multiple master slides make it easy to produce presentations. Version 2.0. Requires Mac Plus or later, System 4.1 or later, and a harddisk drive. \$495. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (206) 622-5500. (May '89) \* '88 Eddy

PowerPoint \$\$\$\$

PowerPoint is an easy-to-use desktop-presentation tool. Good color schemes. Can send presentations to Genigraphics to produce color 35mm slides. Version 2.01. Requires System 4.1 or later, Mac Plus or later. \$395. Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (800) 426-9400, (206) 454-2030. (Aug '87) \* '87 Eddy

StandOut! \$\$\$\$

StandOut! is a presentation program built like a publishing program, with strong text and graphics support. Automatic text flow around graphic objects. Lacks good graphic examples. Version 1.0. Requires Mac Plus or later, \$295. Letra-set USA, 40 Eisenhower Drive, Paramus, NJ 07653. (800) 343-8973, (201) 845-6100. (Nov '88)

# EDUCATION

Alphabet Blocks \$\$\$\$\$

Alphabet Blocks teaches prereaders the letters and sounds of the alphabet. The digitized voice of an on-screen elf is clear and pleasant. Very intuitive program. Requires Mac Plus or later. \$59.95. Bright Star Technology, 1450 114th Ave. S.E., Suite 200, Bellevue, WA 98004. (206) 451-3697.

Interactive Physics

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Interactive-Physics is the best physics teaching tool you can buy short of a laboratory. Students set up experiments using a drawing environment, attach objects with various strings and springs, and then watch the animated results on-screen. Blackand-white only. Version 1.0. Requires Mac Plus. \$249. Knowledge Revolution, 497 Vermont St., San Francisco, CA 94107. (415) 553-8153. (April '89) ★'89 Eddy Reader Rabbit ‡‡‡‡

Reader Rabbit teaches four-toeight-year-olds how to read with four elegant games that build on one another. Version 2.2. Requires Mac SE/30 or later, \$59.95. The Learning Co., 6493 Kaiser Drive, Fremont, CA 94555. (800) 852-2255. CP (June '88)

Voyager, the Interactive Desktop Planetarium \*\*\*\*

Voyager, the Interactive Desktop Planetarium, lets you view the sky as a star chart, as a celestial sphere, or as seen from anywhere in the universe. Includes an extensive astronomical database. Terrific learning tool. Version 1.2. \$124.50. Carina Software, 830 Williams St., San Leandro, CA 94577. (415) 352-7328. (Sept '89)



# ENTERTAINMENT

Bomber tttt

Bomber is a great HyperCardbased simulation. You attack Germany during WW II, flying a B-17. Great sound (you'll probably need 2 megabytes of RAM); headphones are provided so you don't disturb others. Requires HyperCard 1.2.1 or later. \$39.95. In-Line Design, 70 W. 95th St., Suite 26F, New York, NY 10025. (212) 222-4837. (Feb '90)

Crystal Quest 1111

Crystal Quest combines all the good elements of nearly every video game ever made. Move a piece around to gobble up points and crystals. Shoot the nasties, and get through the goal before they get you. Excellent sound effects. In color on the Mac II. Version 2.2X. Requires Mac 512K or later. \$49.95. Casady and Greene, P.O. Box 223779, Carmel, CA 93922. (408) 624-8716. (Apr '88) \* '88 Eddy

Fool's Errand tttt

Fool's Errand is an outstanding collection of 80 puzzles woven around a mythical theme of an evil priestess and the search for wisdom. Version 2.0. Requires Mac 512K

or later. \$49.95. Miles Computing, 5115 Douglas Fir Road, Suite I, Calabasas, CA 91302. (818) 340-6300. (July '88)

SimCity \$\$\$\$ SimCity is an animated game that's also a city-planning simulator. You can work on any one of eight scenarios included in the package or build your own city from the ground up. Evaluation window gives you instant feedback on your efforts. Version 1.2. Requires Mac 512K or later. \$49.95; Terrain Editor, \$24,95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. (June '89) \*'89 Eddy

SimCity Supreme \$\$\$\$\$

SimCity Supreme is the color version of SimCity. Has all the advantages and virtues of the original, plus it's not copy protected. Version 1.1c, Re-quires Mac 512K or later. \$69.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. (June '89)



### BUSINESS

atOnce! tttt//

atOnce! is an integrated accounting package with generalledger, accounts-payable, accounts-receivable, and payroll modules. Primarily for small businesses. Features very good security, customizable reports. flexible fiscal calendar with 12 or 13 periods per fiscal year, and up to 26 open periods stored on-line. Version 1.0. Requires Mac Plus or later, two 800K drives, and System 4.1 or later; hard-disk drive recommended. \$495. Layered, The Schrafft Center, 529 Main St., Boston, MA 02129. (617) 241-5431. (Nov '89) \* '89 Eddy

**Components General** Ledger tttt

Components General Ledger is part of an integrated accounting series. Provides state-ofthe-art flexibility, integrity, and functionality. Report generator may be strong enough to entice you to import data and use it with other accounting systems. Appealing to users with database or graphics backgrounds, Version 1.0, Requires Mac Plus or later and System 4.1 or later. \$595. Satori Software, 2815 Second Ave., Suite 560, Seattle, WA 98121. (206) 443-0765. (Oct '89)

Computerized Classic Bookkeeping \$\$\$\$\%

Computerized Classic Bookkeeping is an Excel-based integrated accounting system. The spreadsheet interface is intuitive, similar to that of traditional paper journals and ledgers. Supports custom reports, fully detailed audit trail, and password protection. Analysis can be done in Excel at any time. A good alternative to bigger dedicated systems and a good choice for those currently using paper ledgers. Version 2.2. Requires Mac Plus or later, a hard-disk drive, and Excel 1.5. \$395. Absolute Solutions, 3142 Vista Way, Suite 400, Oceanside, CA 92056. (800) 458-3399, (619) 966-8000. (Jan '90)

Plains & Simple tttt

Plains & Simple is an excellent one-write accounting system. Offers full general-ledger, accounts-receivable, accountspayable, and reporting modules. Has 3-to-6-digit account numbers, 14 predefined account categories, full audit trail. and multiple checking accounts. Provides more than 20 comprehensive reports and handles multiple companies. Defaults to accrual-basis accounting. Version 1.05. Requires Mac Plus and a harddisk drive. Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103. (701) 281-0550. (May '90) ★'87 Eddy

### • PERSONAL

Andrew Tobias' Managing

Your Money \$555 Andrew Tobias' Managing Your Money is a feature-laden personal-accounting system with added financial and timemanagement functions. Uses double-entry accounting. Toocute documentation. Now supports variable-interest loans and HP DeskWriter. Version 3.0. Requires Mac Plus or later. \$219.95. MECA Ventures, 327 Riverside Ave., Westport, CT 06881. (203) 226-2024. (Apr '90)

MacInTax ttttt

MacInTax is an excellent tool for preparing tax forms. Intuitive and easy to use, it's consistently the best in its class. Accepts data from the leading personal-finance programs. Good biult-in help. Liberal upgrade policy for current owners. Prints IRS-accepted forms on all LaserWriters and ImageWriters. California, New York, and Massachusetts forms sets also available. First year, \$99; federal, \$119; state, \$65. SoftView, 1721 Pacific Ave., Suite 100, Oxnard, CA 93033. (805) 385-5000. (Mar '87) ★'86, '89 Eddy

Quicken \$\$\$\$\$

Quicken is the best tool for home budgets, cash-flow management, and tax record keeping. Mimics your checkbook, so tracking your finances is easy and intuitive. Provides detailed reports supporting tax deductions and sources of income for Schedules A. B. C. D. and E; Forms 1040 and 2106; and Canadian tax forms. Version 1.5. Requires Mac 512K or later and System 4.1 or later. \$59.95. Intuit, P.O. Box 3014, Menlo Park, CA 94026. (415) 322-0573.(Dec '89) \* '88 Eddy



# GRAPHICS AND DESIGN

Capture \$\$\$\$\%

Capture is a most reliable screen-capture utility. Can capture full screens or any area to either the Clipboard or a PICT file. Supports 8- and 32bit color. May have to be renamed to avoid INIT conflicts. Version 2.0. Requires System 5.0 or later. \$59.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. (818) 991-6540. (Jan '90)

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The Curator \$\$\$\$%

The Curator catalogs your art and graphics so it's easy to see what's what and where it is. Supports PICT, TIFF, EPSF, PostScript, MacPaint, and more. Changes creator types. Version 1.05. Requires Mac 512K or later. \$139.95. Solutions International, 30 Commerce St., Williston, VT 05495. (802) 658-5506. (Sept '88)

Image Studio \$\$\$\$% Image Studio puts a photoretouching lab on your desktop. Editable brushes let you modify digitized images in 65 gray levels. Version 1.5. Requires Mac Plus or later. \$495. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. (201) 845-6100. (June '88)

MultiClip \$\$\$\$% MultiClip lets you create as many Clipboards as memory allows. Can be used as a replacement for the Clipboard and Scrapbook. Has limited editing capabilities but lots of customizing possibilities. Version 2.0. Requires Mac Plus or later and System 6.0.2 or later. \$99. Olduvai Software, 7520 Red Road, Suite A, S. Miami, FL 33143. (800) 822-0772. (Sept '89)

PhotoMac \$\$\$\$

PhotoMac is a powerful colorretouching tool for photographs in PICT and TIFF. Displays and edits in 8-bit mode; saves in 8- or 24-bit modes. Makes color separations, but process requires substantial disk space. Version 1.14. Requires Mac II with 2 megabytes, color monitor, 8-bit video card, and a harddisk drive. \$795. Data Translations, 100 Locke Drive, Marlboro MA 01752. (508) 481-3700, ext. 649. (July '89)

PictureBook tttt PictureBook is a superb Scrapbook replacement. It catalogs your Scrapbook and lets you resize and/or crop anything that can be copied to the Clipboard.

MacUser June 1990 MiniFinders 3

# MINIFINDERS

There's a lot of power here. and the interface is excellent. Version 3.2. Requires Mac 512K or later; hard-disk drive recommended, \$69.95. Loop Software, P.O. Box 1249, Menlo Park, CA 94026. (800) 288-7631. (Sept '89)

Smart Art tttt

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Smart Art is a nifty PostScript utility disguised as a DA. It creates special effects with both text and graphics, and it lets you import EPSF files into any program. Has 15 text effects. Version 1.0.1. Requires Mac Plus or later and PostScript printer. \$149.95. Emerald City Software, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (800) 447-3577, (415) 324-8080. (Oct '89)

SmartScrap and The Clipper \$\$\$\$%

SmartScrap and The Clipper are two useful DA utilities for graphics work. SmartScrap is a major enhancement to the standard Scrapbook DA. The Clipper provides a transparent Clipboard window that lets you resize or crop a graphic to the area in which it will be pasted. Version 2.01. Requires Mac Plus or later. \$89.95. Solutions International, 30 Commerce St., Williston, VT 05495. (802) 658-5506. (July '87) \*'87 Eddy

SnapJot tttt

SnapJot is a utility that lets you capture screens or parts of screens. Differs from similar products in that the captured window remains on-screen in a real window and you can use it as you work. Version 2.0. Requires System 4.1 or later. \$49.95. Wild Flower Software, 21W171 Coronet Road, Lombard, IL 60148. (708) 916-9350. (Oct '89)

Streamline \$\$\$%

Streamline is Adobe's dedicated PostScript auto-trace package. Auto-tracing is all it does. Can quickly produce nearly print-ready traces with little tweaking. Retains origi-nal images' black-and-white values. Final touch-ups must be completed in Illustrator 88 or a similar program. Expensive for a single-function utility. Version 1.0. Requires Mac Plus or later and System 4.2 or later; 2 megabytes recom-mended. \$395. Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (800) 922-3623. (Nov '89)

### · CAD

DynaPerspective \$\$\$\$

DynaPerspective is a good 3-D architectural-modeling pro-gram ported from DOS. Can create perspective drawings and elevations automatically from a floor plan. Objects can

be made translucent, so windows and water effects are possible. It can produce ani-mations that "fly" you around buildings and in and out of rooms. Version 1.2. Requires Mac II or later. \$1,495. Dynaware, 1163 Chess Drive, Suite J, Foster City, CA 94404. (415) 349-5700. (July '89)

MiniCad+ tttt

MiniCad+separates itself from its competition with a Pascallike macro language, 3-D graphics, and a spreadsheet. Has a MacDraw-like feel, but added features compete with Claris CAD. May have the best 3-D capabilities among lowcost CAD programs. Version 2.0. Requires Mac Plus or later, a hard-disk drive, and System 6.0; 2 megabytes recom-mended.\$695. Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043. (301) 461-9488. (Dec '89)

Vellum \$\$\$\$%

Vellum combines CAD with AI. Lean, uncluttered interface. The Drafting Assistant provides continuous readouts on cursor position, and object geometry. Supports associative, and parametric dimensioning. No on-line help or support for IGES format. Reads DXF, PICT, and ASCII text files. Version 1.0. Requires SE/30 or Mac II series, System 6.0.2, and a hard-disk drive. \$995. Ashlar, 1290 Oakmead Parkway, Suite 218, Sunnyvale, CA 94086. (408) 746-2980. (May '89) ★ '89 Eddy

VersaCAD tttt

VersaCAD is a powerful CAD program that doesn't show any of its DOS roots. Excellent element manipulation, full plotter support. Library user interface is crude. Version 2.2. Requires Mac Plus or later. \$1,995. Versacad, 2124 Main St., Huntington Beach, CA 92648. (714) 960-7720. (July '88) ★'88 Eddy

### DRAWING AND PAINTING

Canvas 2.0 \$\$\$\$\$

Canvas 2.0 is a rich drawing/ painting program, featuring full Bezier curves, the cutting and joining of polygons, skewing, perspective and distortion, auto-dimensioning, area and perimeter calculation, autotracing of bit maps, and full color support. Creates and edits high-resolution bit maps to 2,540 dpi. Slightly less-pow-erful DA version available. Version 2.0. Requires Mac Plus or later and System 6.0 or later. \$299. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (305) 594-6965. (Apr '89) \* '89 Eddy

FreeHand 2.0 \$\$\$\$\%

FreeHand 2.0 is a major upgrade. Greatly increased power

includes up to 100 levels of undo, auto-trace, a Blend command for interpolating shapes and colors, and expanded text manipulation. Has a steep learning curve but is relatively easy to use once you've got the hang of it. Version 2.0. Requires Mac Plus or later. \$495. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (206) 622-5500. (June '89)

DeskPaint and DeskDraw tttt

DeskPaint and DeskDraw are a pair of DA graphics utilities. DeskPaint handles bit-mapped files, and DeskDraw handles PICT files. Somewhat busy interface due to be upgraded. Very useful tools for DTP. DeskPaint, version 2.01C; DeskDraw, version 1.3. DeskPaint Requires Mac 512K or later; DeskDraw requires System 5.0 or later. \$129.95. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712. (602) 881-8101. (Jan '90)

Adobe Illustrator 88

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Adobe Illustrator 88 is a professional-level graphics program from the people who defined the PostScript language. Uses templates for precise drawing and detailed artwork. Version 1.8.3. Requires Mac Plus or later. \$495. Adobe Nate Plason Half 3493, Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (800) 344-8335. (Oct '88) ★'88 Eddy

MacDraw II ttt%

MacDraw II updates the venerable object-oriented drawing program. Adds dithered and color patterns in its own documents but doesn't support color in PICT II format. Version 1.1v2. Requires Mac Plus. \$395. Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052. (408) 987-7000. (Nov '88)

Origins \$\$\$

Origins is a 2-D drafting and 3-D rendering program with lots of rough edges. Point-orientation method of drawing takes some getting used to. Both versions have very busy, nearly overwhelming screens with long menus and huge palettes. Version 2.0.5. Requires Mac Plus or later for monochrome, Mac II or later for color. Monochrome, \$495; color, \$595. Deltasoft, P.O. Box 55089, Tulsa, OK 74155-5089. (918) 250-5594. (Mar '90)

Paradigm \$\$\$%

Paradigm is a drawing program with a difference. It does relational drawing (and does it very well) in which each point's position depends on the location of other points - if you move a point, the rest of the drawing reacts correspond-ingly. Version 1.0. Requires

Mac Plus or later. \$120. Acuity, 2340-B Grant St., Berkeley, CA 94703. (415) 841-9533. (Mar '90)

**PixelPaint Professional** 

PixelPaint Professional is the 32-bit descendant of the original PixelPaint. Interface sometimes hides the well-designed painting tools' capabilities. Supports four 256-color palettes per document. Includes several color-blending and -manipulating tools as well as anti-aliasing. Still has a few glitches but is a serious and necessary tool for electronic artists. Version 1.0. Requires Mac II series or SE/30; System 6.03 or later; hard-disk drive; 2 megabytes for 8-bit color, 4 megabytes for true color; 8-, 16-, 24-, or 32-bit video card; and color or gray-scale monitor, \$699. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Dec '89)

Studio/1 ttt/

Studio/1 is an excellent monochrome painting program that has impressive flip-frame animation capabilities. You'll find an uncluttered animation surface, painting tools with 300dpi capabilities, and a Hyper-Card playback utility (XCMD). Version 1.0. Requires Mac Plus or later. \$149.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (415) 572-2787. (Sept '89)

Studio/8 tttt

Studio/8 is a professional color (8-bit or 256-color) painting application for the Macintosh II that has a superior tool set, an elegant interface, and excellent performance and speed. Version 1.1. Requires Mac II and hard-disk drive; 2 megabytes of RAM recommended. \$495. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (415) 572-2787. (Jan '89) \* '88 Eddy

Super 3D \$5\$\$

Super 3D is an update of an excellent 3-D object-oriented drawing program. Powerful features such as Sweep are easy to use. Can save your 3-D models in VersaCAD format. Version 2.04. Requires Mac Plus or later. \$495. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. (619) 695-6956. (Mar '90) SuperPaint 2.0 \$33\$

SuperPaint 2.0 is the first upgrade of the original painting/ drawing program. Some of the new features are plug-in tools, auto-trace, Bezier curves, support for resolutions exceeding 300 dpi, and eight-color support. A good program but not particularly fast. Version 2.0. Requires Mac Plus or later. \$199. Silicon Beach Software, 9770 Carroll Center Road, San

# MINIFINDER Showcase

# TypeStyler: Put your best font forward.

With TypeStyler, you can turn type into an exciting tour de force.

Bend. Twist. Rotate. Stretch. Then, call on an amazing range of styling effects. Fades and fills. Shadows and patterns. Inlines and outlines, circular text and more.

TypeStyler comes with 10 AGFA Compugraphic<sup>™</sup> typefaces. And you can also work with thousands of other commercially available fonts. You can even import or export PICT, Paint and EPS file formats. And export Adobe Illustrator outlines.

All for an introductory price of \$199.95.

For more information, see your dealer or call Brøderbund Software-Direct at 1-800-521-6263



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MacAcademy, a division of Florida Marketing International, Inc. 477 S. Nova Road, Ormond Beach, FL 32174 (904) 677-1918, FAX (904) 677-6717



Randall D. Smith, Pres. Florida Marketing Int'l, Inc.

# MINIFINDERS

Diego, CA 92126. (619) 695-6956. (July '89) Swivel 3D ####

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Swivel 3D quickly forms shaded solids in color. Casts true shadows onto other objects and can project color graphics onto solids. Objects can be linked as jointed and sliding mechanisms that can be manipulated without accidental dismantling. It can tween-animate objects or fly the view through a scene, saving frames for playback. Superb object-manipulation interface. Version 1.1. Requires Mac Plus or later. \$495. Paracomp, 123 Townsend St., Suite 310, San Francisco, CA 94107. (415) 543-3848. (Mar '89) \* '89 Eddy



# HARDWARE AND ACCESSORIES

# INPUT DEVICES

A+ Mouse ttt

The A+ Mouse uses infrared light reflected from a special pad to track mouse movement. No moving parts. Relative movement and clicking action feel similar to that of the standard Mac mouse. Non-ADB version, \$99.95; ADB version, \$129.95. MSC Technologies, 47505 Seabridge Drive, Fremont, CA 94538. (415) 656-1117. (Oct '89)

Apple Scanner ttt/2

The Apple Scanner is not the state of the art but is adequate for scanner neophytes. The 4bit (16 gray levels) scanner comes with AppleScan software and HyperScan, written by Bill Atkinson. Requires System 6.0 or later, hard-disk drive for full-page work, and SCSI connection cables. \$1,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (Feb '89)

Focus \$800GS \$\$\$\$

The Focus \$800GS is a 400dpi, 6-bit gray-scale scanner that simulates resolutions up to 800 dpi. It has superior resolution and good halftone quality. Professional-quality software has extensive editing features and printing options. \$4,350; software, \$495. Agfa Compugraphic, 200 Ballard Vale St., Wilmington, MA 01887. (508) 658-5600. (June '89) ★ '88 Eddy

Mac 105 ADB Extended Keyboard \$\$\$

The Mac 105 ADB Extended Keyboard is a good alternative to Apple's Extended Keyboard, with a larger Return key, later and more-sculpted key tops, and a lower overall weight. Requires Mac SE or Mac II. \$159; with QuicKeys, \$189. Cutting Edge, P.O. Box 1259,

Evanston, WY 82931-1259. (307) 789-0582. (Feb '89)

Mac 'N Touch tttt

The Mac 'N Touch is a touch screen recommended for applications requiring a lot of pointing and clicking; works less well for programs such as graphics packages that require fine control. Available as an add-in screen for Mac SE and II models and as a snap-on screen for the SE only. Mac 'N Touch Add-In, \$745 (SE), \$895 (Mac II); Mac 'N Touch Snap-On, \$595 (SE only). MicroTouch Systems, 55 Jonspin Road, Wilmington, MA 01887. (508) 694-9900. (Oct '89)

Turbo Mouse ADB tttt The Turbo Mouse ADB is a trackball that is a favorite mouse replacement. Mousing and locking functions can be reversed for left-handed people. Has a "chording" feature for a user-specified Command-key function, \$169.95. Kensington Microware Ltd., 251 Park Ave. S., New York, NY 10010. (800) 535-4242, (212) 475-5200. (Oct '89)

# OUTPUT DEVICES

CrystalPrint Publisher 1111

The CrystalPrint Publisher is the first 300-dpi PostScriptclone printer. Based on a RISC microprocessor, it's faster and cheaper than the LaserWriter IINT. Output quality is excellent, but it can't handle Adobe fonts. No manual feed or envelope capabilities. \$4,499. Qume Corp., 500 Yosemite Drive, Milpitas, CA 95035. (800) 223-2479, (408) 942-4000. (Sept '89) \* '88 Eddy

LaserWriter IINT 111

The LaserWriter IINT is Apple's midpriced PostScript laser printer. It's faster than the LaserWriter Plus, with blacker blacks. Gray scale is less even than that of the Plus. Requires Mac 512K or later, \$4,499. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

LaserWriter IINTX \$\$\$\$ The LaserWriter IINTX is Apple's top-of-the-line Post-Script laser printer. 68020 chip makes it very speedy; expandable to 12 megabytes; SCSI hard-disk drive can be attached for fonts. Requires Mac 512K or later. \$5,999. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-

1010. (May '88) LaserWriter IISC \$\$\$

The LaserWriter IISC is Apple's low-end QuickDraw laser printer. Can be upgraded to IINT or IINTX; reasonably fast. Requires Mac Plus or later. \$2,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

PLP II tttt

The PLP II is a bargain-priced 300-dpi QuickDraw laser printer. Excellent printing perfor-mance, although a bit slow. No PostScript support. Requires Mac Plus or later. \$1,399. GCC Technologies, 580 Winter St., Waltham, MA 02154. (617) 890-0880. (Mar '90) ★ '89 Eddy

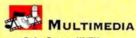
QMS Colorscript 100

tttt

The OMS Colorscript 100 is the first color PostScript printer that uses a four-color thermalwax-transfer technology Works on AppleTalk. Excellent typographic capability. Currently supports only a handful of applications. Requires Mac Plus or later. \$21,995; Model 30, \$19,995. QMS, 1 Magnum Pass, Mobile, AL 36689. (205) 633-4500. (Oct '88) \* '89 Eddy

Tektronix 4693D Color Image Printer 1111

The Tektronix 4693D Color Image Printer is a 300-dpi bitmapped color printer. Colors look smooth and rich. Uses bitmapped screen fonts; most type has noticeable jaggies. Requires Mac II with color monitor. Recommended 8-megabyte configuration, \$8,995. Tektronix, P.O. Box 1000, MS-63583, Wilsonville, OR 97077. (800) 835-6100. (Oct '88)



ColorSpace III/FX 1111

ColorSpace IIi/FX brings live 24-bit video to the Mac. The FX board converts regular TV signals so they can be displayed on the Macintosh. It also offers sophisticated special effects. Includes Digitizer DA to grab frames for export. The Ili lets you mix live video with computer graphics. Requires Mac II or later. IIi, \$2,299; FX, \$3,499. Mass Microsystems, 550 Del Rey Ave., Sunnyvale, CA 94086. (800) 522-7979, (408) 522-1200. (Mar '90) \* '88 Eddy

MacRecorder tttt/2

MacRecorder is an audio digitizer for adding sounds to your Mac, animations, or HyperCard stacks. Supports an extensive array of audio-manipulation effects. HyperSound Toolkit makes adding sounds to Hyper-Card stacks easy. Version 2.0. Requires Mac Plus or later; HyperSound requires Hyper-Card version 1.2.1 or later. \$249. Farallon Computing, 2000 Powell St., Suite 600, Emeryville, CA 94608. (415) 596-9100. (Jan '90)

MacroMind Director tttt MacroMind Director is the best tool for creating color and black-and-white presentations.

Its object-oriented animation capabilities provide numerous editing features. Allows MIDI input. Version 1.0.1. Requires Mac Plus or later and 2 megabytes for color. \$695. Macro-Mind, 410 Townsend St., Suite 408, San Francisco, CA 94107. (415) 442-0200. (Sept '89) ★'89 Eddy

# Music

Finale 2.0 **tttt**/2

Finale 2.0 is the upgraded version of Coda's complex, revolutionary music-notation program. Finale packs power and a much-improved interface and manuals. It's best suited for users needing absolute control over all the music elements in large-scale compositional and/ or publishing projects. Version 2.0 Requires Mac Plus, harddisk drive, MIDI instrument and interface, and PostScript printer. \$749. Coda Music Software, 1401 E. 79th St., Minneapolis MN 55425-1126. (612) 854-1288. (May '90)

Master Tracks Pro tttt/ Master Tracks Pro is a fullfeatured second-generation MIDI sequencer that adheres to the Mac interface very well. It was the first program to have graphics editing. Version 4. Requires Mac 512KE or later. \$495. Passport Designs, 625 Miramontes St., #103, Half Moon Bay, CA 94019. (415) 726-0280. (Dec '87)

Performer \$\$\$\$

Performer is a full-featured MIDI sequencer that has looping, SMPTE syncing, 32 simultaneous Ins and Outs, unlimited overdubbing, and compatibility with Professional Composer for transcription. Version 3.4. Requires Mac 512K or later and MIDI interface. \$495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. (617) 576-2760. CP (Jan '88)

**Professional Composer** ttt%

Professional Composer produces performance-quality sheet music, using Adobe's Sonata font. Scores can be created from scratch or imported from Performer (and can be exported to Performer for MIDI playback). Version 2.3. Requires Mac 512K or later. \$495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. (617) 576-2760. CP (Jan '88)

Vision tttt/

Vision sets a new standard in Mac sequencers. Supports full SMPTE control, event-list and graphics editing; real-time and step recording; looping; tempo, meter, and dynamic changes; and standard MIDI files, MIDI Keys maps certain Macintosh

# MINIFINDER Showcase

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# **Abaton Scan 300/GS**

Abaton Scan 300/GS is a 300 dpi, 8-bit scanner that offers 256 levels of true gray-scale scanning. It supports line art, halftone, and gray-scale scanning modes as well as mirroring and inverting scanned images. The flatbed design of the Scan 300/GS facilitates accurate alignment of documents up to 8.5" x 14", while the removable lid allows scanning of oversized drawing and maps. It has 255 brightness settings and 255 contrast settings for adjusting the scan of a dark or light original. Abaton Scan DA is shipped with the scanner to allow users to scan images from within any Macintosh application without exiting the current program.



Abaton Technology Corp. 48431 Milmont Drive Fremont, CA 94538

(800) 444-5321

### System Requirements

Macintosh—Ilcx, IIx, II, SE/30, SE or Plus PC—IBM PC, XT, AT, PS/2 or compatible

# Price

\$1795 for scanner \$395 for PC or Mac interface kit

### Support

90-day on-site maintenance service; extended warranty available upon request

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Language Master gives you instant access to more than 80,000 dictionary definitions plus 470,000 synonyms from Merriam-Webster—the English language authority.

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# HandOff<sup>™</sup> Eliminates "Application Not Found!"

If a document's application is missing, <code>HandOff</code> will let you assign the document to any compatible application (e.g., MacPaint files to SuperPaint). PC users can assign files by filename extension (e.g., .WK1 files to Excel) so that all documents can be opened directly from the Finder. <code>HandOff II</code> adds the ability to assign files by type (e.g., PICT files to MacDraw) and provides a convenient pop-up menu for launching applications while automatically changing color depth and sound level to suit the application (e.g., HyperCard requires 2-color mode for special effects).

Retail prices: HandOff, \$49.95; HandOff II, \$79.95

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# MINIFINDERS

keyboard commands to your MIDI controller. Faders window supports 32 faders offering real-time control of volume, tempo, and synthesizerspecific functions. Version 1.1. Requires Mac Plus or later. MIDI interface, and MIDI synthesizer. \$495. Opcode Systems, 1024 Hamilton Court. Menlo Park, CA 94025. (415) 321-8977. CP (Dec '89)

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# DATA ACQUISITION AND ANALYSIS

DeltaGraph tttt

DeltaGraph is the new champion charting tool, Has 22 types of 2-D and 3-D charts. Uses up to 256 colors per chart. Easy to use and can import data from most sources. Version 1.0. Requires System 6.0.2 or later. \$195. DeltaPoint, 200 Heritage Harbor, Suite G, Monterey, CA 93940. (408) 648-4000. (Mar '90) \* '89 Eddy

KaleidaGraph \$\$\$\$

KaleidaGraph is a superb dedicated graphing-and-analysis package. Data can be entered on a 256-column-by-32,000row spreadsheet. Creates exceptionally nice output. Version 2.0. Requires Mac Plus or later. \$249. Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606. (215) 779-0522. (Feb '90)

LabVIEW 2 \$\$\$\$\$ LabVIEW 2 is a graphical programming environment for creating applications for GPIB and other data-acquisition and -control operations. Data analysis includes complex math and signal processing. Users can create on-screen control panels to emulate test instruments. The most complete such package for either PC or Mac. Requires Mac Plus or later and hard-disk drive. \$1,995. National Instruments, 6504 Bridge Point Parkway, Austin, TX 78730-5039. (800) 433-4388, (512) 794-0100. (July '89)

Parameter Manager

Plus \$\$\$\$ Parameter Manager Plus analyzes data, using spreadsheetlike interface in real time. It can handle both hand-entered and imported data. Includes statistical quality control, equation fitting, predictive maintenance, histograms, drawing, and presentation. Version 3.0. Requires Mac Plus or later. \$595; communications module, \$795. GenRad, 510 Cottonwood, Milpitas, CA 95035. (408) 432-1000. (July '89)

SuperANOVA \$\$\$\$ SuperANOVA is a slick linear-modeling program with a great interface. This is not a general statistics program but a more specialized tool. Feature-laden and powerful. Version 1.02. Requires Mac Plus or later. \$495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. (415) 540-1949. (Mar '90) \* '89 Eddy

# MATHEMATICS

# Mathematica \$\$\$\$%

Mathematica is a powerful tool for doing all kinds of math. Offers arbitrary-precision numerical calculations, symbolic computation, PostScript graphics, and programmability. Version 1.2. Requires Mac Plus and a hard-disk drive; require 2 megabytes RAM to run kernel. \$495; Mac II version, \$795. Wolfram Research, P.O. Box 6059. Champaign, IL 61826. (800) 441-6284, (Nov '88) ★'88 Eddy

Theorist ####

Theorist is an elegant equation solver that surpasses Mathematica in ease of use and practical functionality. The equation-derivation process doesn't require any programming, just click-and-drag techniques on standard symbolic algebra. Dozens of math functions and transformations automatically activated by a few menu commands. Can visualize equations and theories through graphs and animation, including 3-D and color. \$379.95. Prescience, 814 Castro St., San Francisco, CA 94114. (415) 282-5864. (Jun '90) \* '89 Eddy

### SPREADSHEETS

# Microsoft Excel tttt

Microsoft Excel 2.2 is a major upgrade. Improvements include variable row heights, multiple fonts, improved macros, hot links to other Microsoft products, and an end to the 1-megabyte limit. Excel remains the standard. Version 2.2. Requires Mac Plus or later and System 6.0.2 or later; harddisk drive recommended, \$395. Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (800) 426-9400, (206) 454-2030. (Sept '89)

**Full Impact** 

tttt

Full Impact is a full-featured spreadsheet that produces good presentations and has a smoother interface than Excel. Uses virtual memory to create bigger spreadsheets than any other product, needing more than I megabyte of RAM. FullTalk macro language is easy and graceful, and X-Macros give access to C, Pas-cal, and Mac ToolBox calls to customize menus and create functions. File sizes are bigger than those of other spread-sheets. Version 1.1. \$395. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502, (213) 329-8000. (Apr '89)

WingZ tttt

WingZ combines a powerful and roomy spreadsheet with an easy-to-use scripting language for developing customized applications. Lacks a few standard spreadsheet niceties but makes up for it with glitzy graphics, including color and 3-D. Version 1.1. Requires 1 megabyte. \$399; University edition, \$89. Informix Software, 16011 College Blvd., Lenexa, KS 66219, (913) 599-7100. (June '89)

Microsoft Works tttt%

Microsoft Works has been the integrated program of choice for years. Package includes word processing, spreadsheet, database, telecommunications, and object-oriented graphics. Supports color. Excellent value. May be all the software you'll ever need. Version 2.0a. Requires Mac Plus or later and two 800K drives, \$295, Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (800) 426-9400, (206) 454-2030. (May '89)

# ORGANIZATIONAL TOOLS 12

# • OUTLINERS

### Acta Advantage tttt/2

Acta Advantage is an outliner application. Also comes with the Acta DA. Smart Paste lets you paste material from other applications into Acta outline format. Includes drivers for translating Acta outlines into MORE and ThinkTank (both ways), and into MacWrite, WriteNow, Works, and RTF files. DA, version 3.01; application, version 1.03. Requires Mac 512KE or later. \$129. Symmetry, 8603 E. Royal Palm, Suite 110, Scottsdale, AZ 85258. (800) 624-2485. (Aug '89) \* 89 Eddy

MORE II \$\$\$\$\$

MORE II is an outlining and organizational tool that is an improvement over its predecessors, MORE and Think-Tank. It has on-screen capabilities well beyond its competitors', especially in a multimonitor setup. Version 2.01. Requires Mac Plus or later, System 4.1 or later, and a harddisk drive. \$395. Symantec, Living Videotext Division, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. (May '89)

# PERSONAL-INFORMATION MANAGERS

DynoDex \$\$\$\$

DynoDex is an address-book program. Comes with a nice binder to hold your printouts. Prints on both sides of the paper. Special paper to fit Filofax binders is included. Nice work, but needs a DA to access data while in other applications. Version 1.01. Requires Mac Plus or later, \$149.95. Portfolio Systems, 158 Flushing Ave., Brooklyn, NY 11205. (800) 729-3966. (Feb '90)

QuickDEX \$\$\$\$%

OuickDEX keeps your telephone numbers in an electronic Rolodex DA. Can dial phones easily. Version 1.4a. Requires Mac 512KE or later; hard-disk drive recommended. \$60. Casady & Greene, P.O. Box 223779, Carmel, CA 93922. (408) 624-8716. (Jan '89)

Rendezvous \$111

Rendezvous is a classy personal organizer with excellent printing abilities. Lacks a name-and-address section and needs automatic transfer of data between sections. Still, it's nice and quite useful. Version 2.5. Requires Mac 512KE or later and System 6.0 or later. \$200. PMC Telesystems, P.O. Box 5127, Vancouver, British Columbia V6B 4A9, Canada. (604) 255-9949. (Feb '90)

### PROJECT PLANNERS/ **ORGANIZERS**

### FastTrack Schedule 1111%

FastTrack Schedule is a flexible Gantt-based project scheduler that uses a hierarchical outline format. Provides the highest degree of functionality and the best on-screen and printed graphics abilities in its class. A perfectly suited project-management system for the Mac. Version 1.03. Requires Mac Plus or later. \$195. AEC Management Systems, 20524 Amethyst Lane, Germantown, MD 20874. (301) 428-3694. (Oct '89)

KeyPlan \$\$\$\$

KeyPlan is an ideal projectmanagement package for people who don't want or need the complexity of MacProject II or Micro Planner Plus. Uses an outliner as the primary organizing element. Can produce network diagrams, Gantt charts, and project lists. Can import and export Acta files. Supports multiple-page charts. Version 1.0. Requires Mac Plus and System 6.0.2. \$395. Symmetry Software, 8603 E. Royal Palm Road, Suite 110, Scottsdale, AZ 85258. (602) 998-9210. (April '89) \*\* 89 Eddy

MacProject II ttt

MacProject II is a well-executed PERT and CPM projectmanagement system with time and expense reporting. Can manage projects and produce management reporting. Crisp documentation with an easyto-follow design makes this package a true value. Version 2.1v2. Requires Mac Plus or later, \$499. Claris Corp., 5201

# MINIFINDER Showcase

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uShare networks Macintoshes to high-performance UNIX hosts. Besides sharing files and resources, Macintosh users enjoy large and inexpensive disk capacity and greater processing power. In addition to standard UNIX features and utilities, uShare provides its own electronic mail, remote system disks, and print spooling.

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uShare works with Macintoshes on LocalTalk and Ethernet and is available for UNIX machines from a dozen manufacturers.

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MacUser, December 1989

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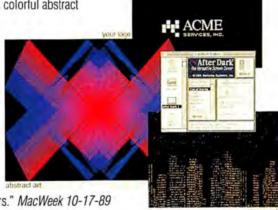
After Dark has **eighteen** entertaining screen saving displays, including crashing lightning bolts, meteors, colorful abstract patterns, and a jump to light speed.

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# Dynamac Computer Products, Inc.

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# MINIFINDERS

Patrick Henry Drive, Santa Clara, CA 95052. (408) 987-7000. (Oct '89)

Micro Planner Plus and Project Exchange \$\$\$\$\%

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Micro Planner Plus and Project Exchange provide full PERT and CPM implementations with advanced resource leveling and management reporting. Output can be used easily for management presentations. Micro Planner Plus, version 6.1F; Project Exchange, version 1.08. Requires Mac Plus or later. Micro Planner Plus, \$595; Project Exchange, \$100. Micro Planning International, 655 Redwood Highway, Suite 311, Mill Val-ley, CA 94941. (415) 389-1420. (Oct '89)

Tim Berry's Business Plan

Toolkit \$\$\$\\\^{\frac{1}{2}}\tag{Tim Berry's Business Plan Toolkit is an integrated set of Excel macros and templates with HyperCard-based text that makes creating business plans and forecasts relatively easy. Excellent manual. Version 3.01. Requires Mac 512K or later and System 4.2 or later. \$99.95. Palo Alto Software, 260 Sheridan Ave., #219, Palo Alto, CA 94306. (415) 325-3198. (Sept '89)

TopDown tttt TopDown is a strong flowchart and organization-chart tool with a choice of connection modes for each individual line. Can generate text-based reports. Has excellent rightangle-reconnection talents, even with major object shifts. Limited user control of where lines connect to symbols. No line nodes for other lines to attach. Excellent navigation throughout hierarchy, view to view, and page to page. Ver-sion 1.1a. Requires Mac Plus or later and System 6.02 or later. \$345. Kaetron Software, 112777 Jones Road, Suite 445, Houston, TX77070. (713) 890-3434. (Jan '90)



# UTILITIES

After Dark tttt

After Dark is an exceptional screen saver with a wide variety of visual modules. Programmers can create modules using the included sample code. Version 1.1. Requires Mac 512KE. \$39.95. Berkeley Systems, 1700 Shattuck Ave. Berkeley, CA 94709. (415) 540-5535. (Dec '89)

**Calculator Construction** Set tttt

Calculator Construction Set lets you build almost any sort of calculator imaginable. The finished calculators are real working DAs. Takes some effort and you'll need to read the manual, but the results are worth it. Version 2.06. Requires any Mac. \$89.95. Dubl-Click Software, 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525. (Feb '90)

DiskExpress tttt

DiskExpress optimizes harddisk-drive performance by reorganizing fragmented files. Best of its kind. Version 1.5. Requires Mac 512K, \$89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090. (Jan '89)

Freedom of Press tttt

Freedom of Press lets you print PostScript-quality output on non-PostScript printers. Limited to LaserWriter Plus font set. Process is slow and creates large PostScript files, but output is nearly indistinguishable from true PostScript printer output. \$495. Version 2.1a. Requires Mac SE/30 or II series and a hard-disk drive. Custom Applications, Building 8, 900 Technology Park Drive, Billerica, MA 01821. (800) 873-4367, (508) 667-8585. (Jan '90) ★'89 Eddy

MasterJuggler \$\$\$\$\$ MasterJuggler is Font/DA Juggler with so many features added that they can't be listed here. A world-class utility. Not as elegant as Suitcase II but has more features. Version 1.5. Requires Mac 512K or later. \$89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090. (Mar '89)

Pyro! tttt/2

Pyro! is the premier Mac screen saver. All the required settings are found in the Control Panel. Current version features modules such as Aquarium and Flashlight. Version 4.0. Requires Mac 512K or later and System 6.0.2 or later, \$39.95. Fifth Generation Systems. 10049 N. Reigal, Baton Rouge. LA 70809. (800) 873-4384. (Sept '89)

Quickeys . tttt

QuicKeys lets you make full use of your keyboard, Assign any command (menu choices, DAs. etc.) or series of text blocks and/or command to any key or key combination. Enormously powerful; necessary for Apple Extended Keyboard owners. Version 1.2. Requires Mac 512K or later. \$99.95. CE Software, P.O. Box 65580, West Des Moines, IA 50265. (515) 224-1995. (Jan '88) ★'87 Eddy SAM (Symantec AntiVirus

for Macintosh) \$\$\$\$\$

SAM (Symantec AntiVirus for Macintosh) is the best commercial antivirus utility available. Includes an alert INIT, repair capabilities, and customizable alert options. Version 1.5. Requires Mac 512KE or later and System 4.2 or later. \$99.95; annual-upgrade subscriptions, \$60; one-shot upgrades, \$15. Symantec, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. (Oct '89) \* '89 Eddy

Suitcase II titt

Suitcase II is even better than its predecessor. Increased filemanagement capabilities let you open 99 font, DA, sound, or Fkey files at a time. Can display any installed font in any style. Fonts can also appear in their proper typefaces on the font menus. Includes Font Harmony for resolving font-ID conflicts and Font & Sound Valet for font and sound compression. Version 1.2.6. Requires Mac 512KE or later. \$79. Fifth Generation Systems, 10049 N. Reigal, Baton Rouge, LA 70809. (800) 873-4384. (June '89) ★'87 Eddy

SuperGlue II

SuperGlue II is the best new print-to-disk program. Offers superior operation along with many nice touches, such as Glue Notes (Post-it-like notes) and One-Timer, an Fkey that makes operation immensely easier. Version 2.0. Requires System 6.0 or later. \$119.95. Solutions, Inc., 30 Commerce St., Williston, VT 05495. (802) 658-5506. (Nov '89)

Tempo II \$\$\$\$\%

Tempo II is a powerful keyboard macro program that gives owners of extended keyboards their money's worth. Especially good for building sequential macros. Features include conditional branching and the ability to remember menu selections by name. Version 1.02. \$149.95. Affinity Microsystems Ltd., 1050 Walnut St., Suite 425, Boulder, CO 80302. (303) 442-4840. (Dec '88)

Virex \$\$\$\$\$

Virex is an excellent virus preventer, detector, and eradicator. Works against known viruses and the company has an excellent support and up-date history. Version 2.5. Requires Mac Plus or later and System 5.0 or later. \$99.95; annual update service, \$75. HJC Software, Inc. (a subsidiary of Microcom, Inc.), P.O. Box 51816, Durham, NC 27717. (919) 490-1277. (Jan '90)

Virtual \$\$\$\$1/2

Virtual provides virtual-memory capability for any Mac equipped with a 68030 or a 68020 with PMMU. Works smoothly and comes in versions with a PMMU for those with 68020-based Mac IIs. Version 2.0. Requires 2 megabytes (highly recommended) and a hard-disk drive; System 6.0.2 or later recommended. Without PMMU, \$199; with PMMU, \$275. Connectix Corp., 125 Constitution Drive, Menlo Park, CA 94025. (Jan '90) ★'89 Eddy

### BACKUP AND FILE RECOVERY

Complete Undelete ttttt

Complete Undelete is a superb file-recovery program. Excellent interface, very fast, and capable of recovering even some partially overwritten files. It pays for itself very quickly. Get it. Version 1.0. Requires Mac 512KE or later and System 5.0 or later, \$49.95. 1st Aid Software, 42 Radnor Road, Boston, MA 02135. (617) 782-4676. (Jan '90)

Fastback II tttt

Fastback II supports incremental and differential backups and a choice of compression levels. Backup configurations can be saved as preference files. Macro language supports automated procedures. Nonstandard dialog boxes are occasionally unclear. Version 2.01. Requires Mac 512KE or later and System 4.2 or later, \$189. Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809. (504) 291-7221. (Oct '89)

Redux \$\$\$\$1/2

Redux is an excellent incremental-backup program. Lets you back up files, folders, or entire volumes. You can write scripts using the Redux control language, BackTalk. Comes with Redux Restore, a restore utility that can be distributed freely. Version 1.62. Requires Mac Plus or later. \$99. Microseeds Publishing, 7030-B W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. (July '89)

Retrospect

**\$\$\$\$**½

Retrospect is a full-featured backup-and-archival package that supports storage devices ranging from floppies to DAT drives. Version 1.1 adds sig-nificant performance for SCSI devices, most notably tape drives. Version 1.1. Requires Mac Plus and System 6.0 or later. Dantz Development, 1510 Walnut St., Berkeley, CA 94709. (415) 849-0293. (Dec '89) \*89 Eddy

SUM II tttt

SUM II is an upgraded and expanded version of the essential SUM data-recovery utility. Includes utilities for partitioning, encrypting, backing up (based on Redux), and opti-mizing. None of these modules is preferable to the dedicated packages available, but they all work. The recovery module is still excellent and has a much improved interface. Version 2.0. Requires Mac Plus or later and System 4.2 or later. \$149.95. Symantec, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. (Dec '89)

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# MINIFINDERS

# FILE-DISK MANAGEMENT

CanOpener \$\$\$\$\%

CanOpener searches files at a decent clip for specified strings. Can read and display text, MacPaint, PICT, EPSF, TIFF, RIFF, and MacDraw II formats. The interface looks odd but is quite easy to master. Version 1.1. Requires Mac Plus or later. \$125. Abbott Systems, 62 Mountain Road, Pleasantville, NY 10570. (800) 552-9157, (914) 747-3116. (Feb '90) \* '89 Eddy

HandOff \$\$\$\$%

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HandOff solves the annoying problem of not having the exact application to open a document. You can specify, for example, that Word should open all documents created by MacWrite. Slick. Version 1.1. Requires Mac Plus or later, \$49.95. Software Innovations, P.O. Box 811, Allen, TX 75002. (214) 727-2329. (Feb '90)

On Cue tttt/2

On Cue lets you switch applications without returning to the Finder. Under MultiFinder, active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.3. Requires Mac 512K or later. \$59.95. ICOM Simulations, 648 S. Wheeling Road, Wheeling, IL 60090. (708) 520-4440. (Sept '88) POWERmenus \$\$\$\$\$

POWERmenus is two products in one. The first allows full access to menus from anywhere on-screen. The second, called Gadgets, includes a phone dialer; notepad; and useful application, DA, and Control Panel-item launchers. Version 1.03. Requires System 5.0 or later. \$79.95. Magic Software, 1602 Cascio Drive, Bellevue, NE 68005. (402) 291-0670. (Jan '90)

Sector Collector \$\$\$\$

Sector Collector is a small utility that scans your disks looking for bad or marginal media. It collects these problem areas in a file so they aren't used for other storage. It can eventually save you lost files due to bad disk media. Version 1.0. Requires Mac 512KE or later and System 4.2 or later. \$49.95. 1stAid Software, 42 Radnor Road, Boston, MA 02135. (617) 783-7118, (Feb '90)

SilverLining \$\$\$\$\%

SilverLining is an advanced hard-disk-utility set. It has the best disk-partitioning software available and can format most hard-disk drives. It also has powerful and safe optimizing and testing features. Excellent performance. Also includes DS Backup, acceptable backup software, and a nice disk du-plicator. Version 5.22. Requires Mac Plus and SCSI device. \$99.95. La Cie, 16285 S.W. 85th, Suite 306, Tigard, OR 97224. (503) 684-0143. (Jan '90)

Stufflt tttt

StuffIt compresses files to reduce the amount of space they occupy on-disk. Great for transferring documents via modem. Also joins and encrypts files. Version 1.5.1. Requires Mac 512KE. Shareware fee, \$25. Aladdin Systems, Inc., Deer Park Center, Suite 23A-171, Aptos, CA 95003-4723. (408) 685-9175. (Dec '88)



# WORD PROCESSING

DocuComp \$\$\$

DocuComp lets you compare two versions of a word-pro-cessing document. Displays inserted text in the newer document with underlining and moved text in boldface. Older document shows deleted and moved text with strikeout characters. Excellent reporting feature details all revisions made to a document. Supports text, WordPerfect, WriteNow, and Word formats. Version 1.3. Requires Mac 512KE or later; System 4.1 or later; and WordPerfect, WriteNow, or Word; hard-disk drive recommended. \$159.95. Advanced Software, 1095 E. Duane Ave., Suite 212, Sunnyvale, CA 94086. (800) 346-5392, (408) 733-0745. (Dec '89)

MarkUp \$\$1/2

MarkUp is a multiuser editing tool that just doesn't click. The idea is great, but performance isn't up to snuff. It does offer excellent security and organizational functions, however. Version 1.01. Requires Mac Plus or later. Single user, \$245; two users, \$495; five users, \$995. Mainstay, 5311B Derry Ave., Agoura Hills, CA 91301. (818) 991-6540. (Mar '90)

# OCR

OmniPage tttt

OmniPage is a very good OCR program that can create editable text files from scanned images. It works only with certain scanners and requires a lot of memory, so be sure you can meet its requirements before you buy. Version 2.1. Requires Mac II and 4 megabytes. \$795. Caere, 100 Cooper Court, Los Gatos, CA 95030. (800) 535-7226. (Mar '89) ★'89 Eddy

Read-It! \$\$\$\$%

Read-It! is an OCR package that includes printer drivers for most scanners, batch processing, background operation under MultiFinder, and 22 font tables. Recognizes multiple columns, italics, and some foreign characters but not underlined text, however. Version 2.1. Requires Mac Plus or later, \$495, Olduvai, 7520 Red Road, Suite A, South Miami, FL 33143. (800) 822-0772. (June '89)

TextPert \$\$\$%

TextPert is a trainable OCR package. Requires less hardware than OmniPage does but is slower. Acceptable accuracy requires teaching. Supports more than 30 languages in roman fonts only. Directly supports popular scanners. Version 3.0.1. Requires Mac Plus and high-resolution (at least 200-dpi) scanner. \$995. CTA, 747 Third Ave., Third Floor, New York, NY 10017. (212) 935-2280. (Oct '89)

## • WORD **PROCESSORS**

FullWrite Professional \*\*\* FullWrite Professional combines outlining and word processing with page-layout and drawing capabilities. Its many features mean sluggish performance unless you have a lot of RAM. Still, it's impressive. Version 1.1. Requires Mac Plus or later. \$395. Ashton-Tate, 20101 Hamilton Ave., Tor-rance, CA 90509-9972. (213) 329-0086. (Sept '88)

MacWrite II tttt

MacWrite II is MacWrite's first major upgrade and a big increase in power. Excellent interface. Powerful Search/ Replace function. Elegant multiple-column and mailmerge features. Slightly sluggish performance on 68000 machines. With its open hooks for file translators, it's an excellent choice for mixed environments. Version 1.1v1. Requires Mac Plus or later. \$249. Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052. (408) 987-7000. (Mar '90)

MindWrite \$\$\$\$

MindWrite integrates outlining and word processing better than any other program. Sophisticated search and select options. Unimpressive speed. Version 2.1. \$195. DeltaPoint, 200 Heritage Harbor, Suite G, Monterey, CA 93940. (408) 375-4700. (Feb '88)

Nisus \$\$\$\$%

Nisus is a fast, RAM-based, powerful word processor. Extensive search capability can operate on open or closed files. Includes a color drawing environment and powerful macro language. Supports multiple levels of Undo. Lacks style sheets; looks and feels more like a text editor. RAM-based operation limits functionality on 1-megabyte machines. Version 2.03. Mac Plus, System 5.0 or later, and two 800K drives or hard-disk drive and one 800K drive, \$395. Paragon Concepts, 990 Highland

Drive, Suite 312, Solana Beach, CA 92075. (619) 481-1477. (Feb '90)

QuickLetter \$\$\$\$%

QuickLetter is a well-designed and thoughtfully implemented DA for creating letters and envelopes. You can create stationery, complete with graphics, and maintain an address book that includes salutations. It's the best envelope creator/ printer available. Version 1.02. Requires Mac 512K or later. \$124.95. Working Software, P.O. Box 1844, Santa Cruz, CA 95061-1844. (408) 423-5696. (Apr '89)

Vantage \$\$\$\$

Vantage is a text-editor DA and the commercial version of McSink. It can change case; count the number of lines, words, sentences, or paragraphs in a selection; and search and replace on character strings (including invisibles). Supports macros and external commands written in Pascal. Includes a spelling checker. Version 1.0. Requires Mac 512KE or later. \$99.95. Preferred Publishers, Inc., 5100 Poplar Ave., Suite 617, Memphis, TN 38137. (901) 683-3383. (July '89)

Microsoft Word 4.0 tttt/2 Word 4.0 is the best power word processor you can buy. Excellent speed and a huge list of useful features. Tables command lets you create multicolumn tables of text and graphics easily. Has hot links to Excel and Microsoft Mail. Has enough DTP capabilities to format almost any document, without compromising its performance as a dedicated word processor. Requires Mac 512KE or later and System 3.2 or later. \$395. Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (800) 426-9400, (206) 454-2030. (July '89) \* '89 Eddy

WordPerfect \*\*\*

WordPerfect is a good choice for offices needing PC compatibility but is not so hot otherwise. Good internal file-management system and macro maker. Awkward interface. Version 5.1. Requires Mac 512KE or later and System 4.1 or later. \$395. WordPerfect, 1555 N. Technology Way, Orem, UT 84057. (801) 225-5000. (Feb '89)

WriteNow tttt

WriteNow is the fastest, best pure-writing program avail-able. Excellent spelling checker, mail-merge, graphics inclusion, footnotes, and header/footer control. Interface is as intuitive as the original MacWrite interface. Sup-ports RTF. Version 2.2. Requires Mac with 128K or later. \$195. T/Maker Co., 1390 Villa St., Mountain View, CA 94041. (415) 962-0195. (May '89)

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2400Minifax	PMD TEAX	9600	2400	•	•	•		Any MS-DOS Compatible	\$249
2400Maxfax	PMD 13MF	9600	2400	•			•	Internal PC/XT/AT Hus	\$349
2400BFAX	PMD-LTFAX	9600	2400	•		•		Internal PC/XT/AT Bus	\$199
2400PS	PMD-25FAX	4800	2400	•		•		Internal Micro Channel' Bus	\$249
2400T	PMD-17FAX	4800	2400	•		•		Internal Toshiba Laptop	\$249
2400Maxfax	PMD-4MF	9600	2400	•	•	•	•	Macintosh* Plus or later	\$449
2400Minifax	PMD-7MFAX	9600	2400	•	•	•		Macintosh Plus or later	\$299
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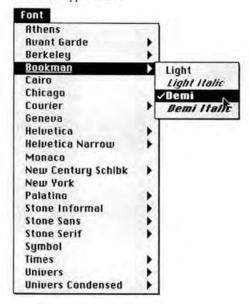
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Font 1Stone Serif 2Stone Sans 3Stone Informal Athens **Avant Garde B** 1Stone Serif Bold **B** 2Stone Sans Bold B 3Stone Informal Bold B Avant Garde Demi ∨B Bookman Demi **B** Courier Bold **B** Helvetica Bold B New Century Schibk Bold **B** Palatino Bold **B Times Bold** B Univers 65 Bold Berkeley Berkeley Black Berkeley Black Italic **Berkeley Bold** Berkeley Bold Italic **Berkeley Book** Berkeley Book Italic Berkeley Italic BI 1Stone Serif BoldItalic BI 2Stone Sans BoldItalic BI 3Stone Informal BoldItalic BI Avant Garde DemiOblique BI Bookman Demiltalic BI Courier BoldOblique BI Helvetica BoldOblique BI New Century Schibk Boldit BI Palatino BoldItalic BI Times BoldItalic **Blk Univers 75** BlkO Univers 75 BlackOblique **BO Univers 65 BoldOblique** Bookman C Univers 57 Condensed Cairo CB Univers 67 CondensedBold CB0 Univers 67 CondBoldObl Chicago **CL Univers 47 CondensedLight** CLO Univers 47 CondLightObl CO Univers 57 CondOblique Courier Geneva Helpetica

After Adobe Type Reunion



While scrolling through our incredibly long font menu one day, we noticed the italics were hiding in the I's and the bolds were huddled in the B's. Usually-but not always. There had to be a better way.

That's why we created Adobe Type Reunion™software. Simply drop Adobe Type Reunion into your system folder and your fonts are automatically sorted by name and weight-forever. Now you can easily find any font, in virtually any application. Plus. Adobe Type Reunion costs just \$65.00 and works with popular font utilities like Suitcase II and Master Juggler.

So if your font families are scattered all over, isn't it time you reunite them? To find

out where you can buy Adobe Type Reunion, just call 1-800-344-8335. Outside the U.S.A. and Canada, call your local distributor.



# SOLUTIONS

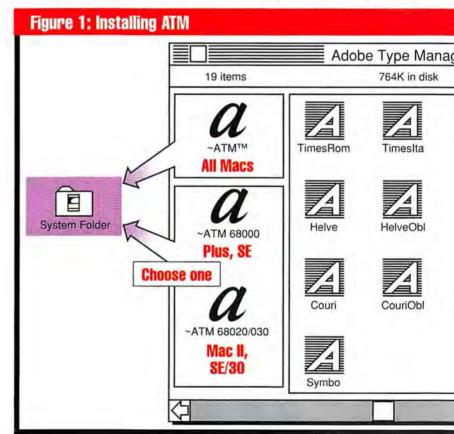
### Managing Adobe Type Manager

ATM demands type training, style savvy, and cache consciousness. Here's a short primer to help you live harmoniously with all letters great and small. n easy way to dampen the creative process is to specify a large or odd point size for your type. It practically guarantees that you'll get ugly-looking text on-screen. This is because the System grabs the bitmapped font closest in size and scales it to suit. Adobe Type Manager (ATM) can

save the day by providing a smooth and accurate screen version of any properly installed font, any time, in any size — if you treat it right.

The reasons for installing ATM vary from wanting screen WYSIWYG for a few fonts, to printing smooth text on non-PostScript printers, to demanding an accurate preview of fancy multifont typographic effects at immense point sizes. This guide presumes that your needs fall somewhere between these extremes. For almost any setup, my initial suggestion is to have at least 2 megabytes of RAM, or you'll pay in speed, frustration, and even crashes — it's not ATM's fault that its task demands working space.

When you select a typeface, size, and style, ATM first tries to use an available



#### **By Salvatore Parascandolo**



bit-mapped version of the font. This works only if it can find exactly the size and style you've requested. If no such bit map exists, ATM builds the screen font from the mathematically defined outlines found in printer fonts. These outline fonts are normally sent to (or reside in) a PostScript printer and enable it to do smooth scaling when it prints text. Whenever ATM can't find the appropriate outline font, you get scaled bit-mapped text, as if ATM weren't there at all.

If you run into trouble with ATM, chances are that it's not installed properly. In addition, many Macintosh users aren't accustomed to handling outline fonts, which are normally built in to their PostScript printers. Figure 1 shows you which ATM elements to place where and

illustrates your choices for installing fonts so that ATM can find them. You should also heed the well-written ATM manual.

#### **Installing Fonts**

On the ATM disk, the Bitmapped Fonts folder contains the screen fonts. If you install them into your System file, be sure to use version 3.8 or later of Font/DA Mover. If you use Suitcase or MasterJuggler, put the screen fonts into your usual font folder. Whatever your approach, you need to install at least the 10- and 12-point sizes of each font. For optimum screen readability of each style, install the plain, bold, italic, and bold-italic versions of each typeface. Even if you already have a Helvetica font, you'll want to replace it with the version that comes

with ATM - it's much more readable.

If you expect to work occasionally with ATM turned off and you still want good-looking large type, don't remove the larger sizes of screen fonts you already have. If you frequently use type that's smaller than 10 points and you have the appropriate font sizes, keep them installed also. They'll look much better than those that ATM constructs, because it just doesn't do as well with teensy screen type.

If you need to bypass ATM but still want good-looking screen text, check out FontSizer from Specialty Software Development (Austin, Texas). If you have a LaserWriter, this utility can build large screen fonts using the printer's internal processor. The resulting bit-mapped fonts can be installed in the same way as any other screen font. With ATM off, however, you won't be able to print high-resolution text on non-PostScript printers unless they employ some other font-scaling technology.

Now for the font outlines. You can put these in one of two places, depending on where you've installed the corresponding screen fonts. If you used Font/DA Mover to add the screen fonts to your System file, put the individual font outlines into your System Folder. If you used Suitcase or MasterJuggler, put the outlines into the folder that contains the screen fonts.

Note that several outline files relate to each family — for example, the Times family includes TimesRom, TimesBol, Timeslta, and TimesBollta. These outlines represent the various weights and styles, such as bold, italic, and bolditalic. For the truest on-screen representation of what you'll get in print, install all these outlines. If you leave out Times-Ita, ATM may print the true italic version (if it's built in to your printer), but it will display a cheap imitation on-screen — a slanted version of the plain font. This pseudoitalic will also appear in print if that style isn't built into your printer. The difference isn't too glaring with Helvetica, but with most typefaces it's like night and day (see Figure 2).

If you install fonts from the Adobe Plus Pack, you'll see a folder labeled AFM Files. Ignore it — the information that it contains is already available from

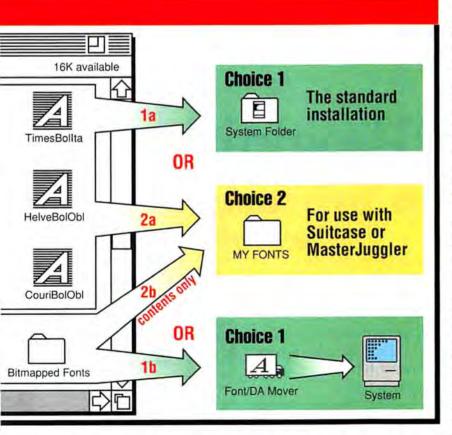


Figure 1: Installing ATM isn't as confusing as it may seem. The ATM cdev (top) works with all Macs. You then select the INIT appropriate for your CPU (68000 or 68020/030). There are two basic options for installing the bit-mapped and outline fonts. Just be sure not to mix and match choices 1 and 2. Restart your Mac after installation to get ATM running.



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**Figure 2: Styled Fonts** 

Times Italic True Italic True Italic True Italic Times Italic Stanted room

Garamond Italic True italic
Garamond Italic Stanted rom

Figure 2: For the truest on-screen representation of what you'll see in print, install the styled outline fonts. If you don't, ATM will display italics, for example, as a slanted version of the roman font. This pseudoitalic will also appear in print if your printer doesn't have the appropriate style built in to it.

the bit-mapped font resource.

Finally, if you own fonts from other developers, make sure they're Type 1 (Adobe-compatible) PostScript fonts. These are the only ones that ATM can

recognize properly. A few type vendors — such as Bitstream, Monotype, and the Font Company (URW typefaces) — now supply their fonts in Type 1 format. Most other companies provide their typefaces

in the more common Type 3 format, and all fonts created with Fontographer are Type 3. Type 3 fonts print just fine, but because ATM can't use their outlines for screen display, you'll get the usual jaggies and lumps from scaled bit maps. Chances are, if you've owned some non-Adobe type for a year or more, it's the wrong stuff for ATM.

#### The Font Cache

If ATM seems to be slowing down operations such as popping into Word's page preview or zooming in a graphics program, you probably need to give it more working space. When ATM creates screen fonts, it temporarily stores the characters in a reserved area of RAM called the Font Cache. When the cache overflows, the currently undisplayed characters are deleted and replaced by newly built ones. When you scroll to a part of your document that contains deleted cached fonts, ATM patiently rebuilds them. This purge/rebuild cycle always takes noticeable time, and you'll blame ATM for slowing you down. Note

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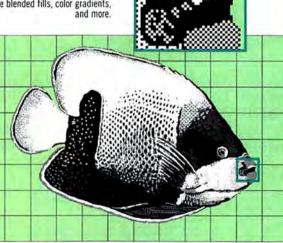
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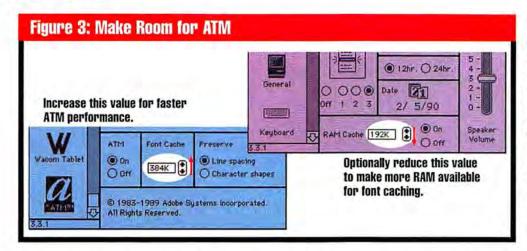
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Figure 3: ATM's performance is significantly affected by how you allocate RAM to two caches. The ATM Font Cache sets aside storage space for saving and reusing ATMproduced screen fonts in various sizes. If you need more RAM for fonts, reduce the size of the system's RAM Cache.

that even if you simply zoom in or out, as with a page-layout or drawing program, ATM will create new font sizes to give you smoothly magnified or reduced characters in each view.

To give your system back its old zip, use the Control Panel DA to access the ATM cdev and then set the Font Cache to 256K or more - sometimes far more. A

large enough cache will pay off in zero waiting time whenever you scroll or zoom. You should pump up the cache appropriately whenever you use large sizes or many different sizes or if you routinely zoom to several levels. Keep in mind that the first time you zoom or use a new font/size/style, ATM will need extra time to build the properly sized screen font. If

you feel consistent system sloth and have the RAM to spare, don't be stingy boost the Font Cache until your working speed feels normal. To make more RAM space for ATM's Font Cache, you can turn off or reduce the size of your RAM Cache in the General cdev (see Figure 3), turn off some INITs, or temporarily forgo running under MultiFinder,

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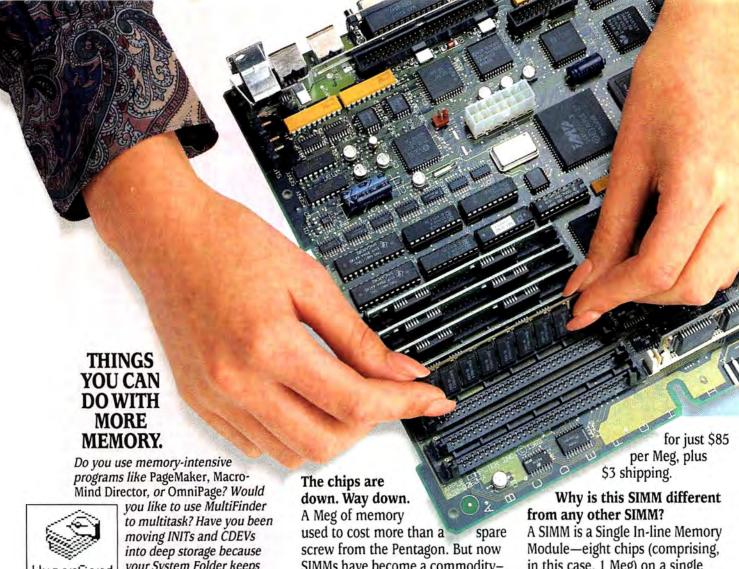
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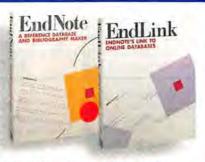
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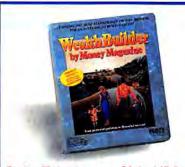
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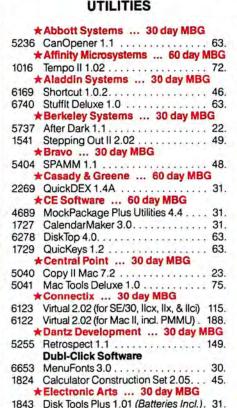
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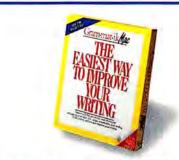


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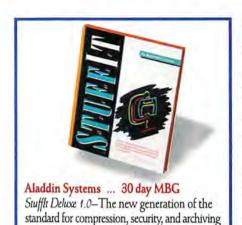


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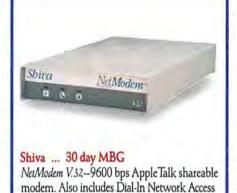
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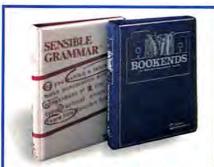
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★CE Software 60 day MBG
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5638 In/Out (10 users) 187.
5174 QuickMail 2.2 (5 user Pak) 215.
5173 QuickMail 2.2 (10 user Pak) 315.
★CompuServe 60 day MBG
1676 CompuServe Information Service 23.
1673 CompuServe Navigator 2.1 39.
1674 Standard Service/Navigator Bundle 59.
Connect, Inc.
5834 Connect 1.5 for the Macintosh 63.
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4842 MacLink Plus/Translators 4.12 99.
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6758 DoveFax Desktop
4939 FastNet III
4938 FastNet SE
5624 FastNet SE/30
4937 FastNet SCSI 749.
5391 FastNet LAN 1
5390 FastNet LAN 2 (1 Meg) 1349.
5389 FastNet LAN 3 (math chip) 1219.
5388 FastNet LAN 4 (1 Meg/chip) 1549. 5387 FastNet LAN 5 (4 Meg) 1439.
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4866 Timbuktu/Remote 1.0.1
6371 Timbuktu/Remote Access Pack 849.
4867 Timbuktu 30-Pack 3.0
2201 TrafficWatch 1.08
2202 PhoneNET to LocalTalk Adapter 8.
5664 PhoneNET StarConnector 19.
6273 PhoneNET StarConnector 10-Pack . 129.
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6659	QD2000 40 MB Data Cartridge	19
1	MAXELL 60 day MBG	
2792	31/2" DS/DD Disks (10)	14
2793	31/2" HD Disks 1.44 Meg (10)	27
1	3M 60 day MBG	
3943	DC2000 40 MB Data Cartridge	20
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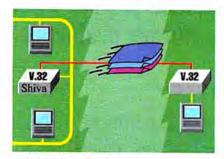
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### Currents



#### **Speed Skills**

Shiva has long dominated the market of making serial devices accessible from AppleTalk networks. With the release of its new 9,600-bps NetModem V.32, Shiva produces another first and also fills a major gap in the Mac market.

The NetModem V.32's main function is to allow anyone on an AppleTalk network to use a V.32 modem. V.32 is the CCITT standard for 9,600-bps full-duplex modems. All major modem manufacturers now support V.32 as the 9,600-bps standard—any V.32 modem can talk to any other V.32 modem. As file sizes continue to grow, 9,600-bps file transfers can make moving data much more pleasant. Having one V.32 modem on a network rather than connected to a specific Mac means that high-speed file transfer is available to any network user.

The NetModem incorporates the functionality of Shiva's TeleBridge, an AppleTalk half-bridge. If you have a NetModem V.32 connected to your network, you can use any V.32 modem to access the network remotely. Although your connection is at a relatively slow 9,600 bps — compared with LocalTalk's 230.4 Kbps — E-mail, file transfer, and access to any other network services are as easy as they would be if your Mac were plugged directly into the network.

If you have two NetModem V.32s, you can connect two entire AppleTalk networks remotely. All users on both networks can then access servers and printers on either network.

The NetModem V.32 retails for \$1,999. Shiva Corp., 155 Second St., Cambridge, MA 02141; (617) 864-8500, fax (617) 864-0914.

- Stephan Somogyi

#### **Gateways Galore**

In the April issue's Currents section, we described a suite of new gateway products from Avatar that expand the number of ways to link to an IBM mainframe while increasing the number of Macs that can be linked. Now the two other leading Mac-to-mainframe companies, DCA and Tri-Data, have announced mainframe gateway-server products. This mass of new options has still not led us to generic SNA (systems network architecture) connectivity, because each vendor takes a somewhat different approach.

#### **New IRMA**

DCA enters the ring with the Mac-IRMALAN 802.2 Gateway Server for token-ring networks (\$4,495 for 16 users, \$6,495 for 64 users) and the Mac-IRMALAN SDLC Gateway Server for

remote connection to a mainframe (\$3,495 for 16 users, \$5,495 for 64 users). Both software products run on a PC and connect either a LocalTalk or a token-ring network to a host; the difference is in the method of connection.

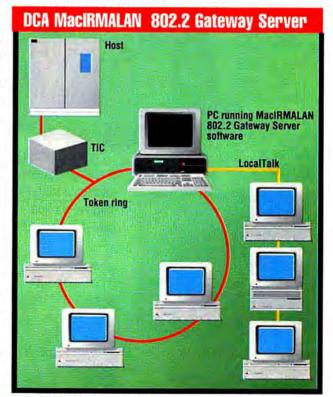
The 802.2 Gateway Server connects a token-ring network (including Token-Talk) directly to an IBM mainframe computer through a piece of IBM hardware called a token interface coupler (a TIC. to MIS people). A LocalTalk LAN cannot be directly linked to a mainframe with the 802.2 Gateway Server. The PC on which the gateway server runs must be part of a Token Ring that has a TIC connected to it.

If you require a

remote connection to a mainframe via a modem, you can take advantage of the SDLC Gateway Server. Because of the typical modem's speed, SDLC is quite a bit slower than a direct network connection; an 8-second mainframe response time is common. DCA has not announced support for Ethernet yet but expects to have that capability by the end of the year. The 802.2 and SDLC servers are scheduled to ship by late spring.

Unlike Avatar, which puts gateway software and hardware into Macs, DCA is not planning Mac versions of the gateway-server software. The PC gateway approach can save money, because PCs are generally cheaper than Macs. Users who already have DCA's PC-to-mainframe gateway servers need only the new software to set up one of the new Mac-IRMALAN systems.

If you already have a Mac with Apple-Talk Internet Router or Liaison (version 2.1 supports TokenTalk and AppleTalk Phase 2) on your network, DCA's solution requires an additional PC to serve as the gateway. In contrast, Avatar's gateway servers run on the same Mac as



DCA's MacIRMALAN 802.2 Gateway Server software lets Macs on LocalTalk networks access mainframes through a PC that has both LocalTalk and token-ring cards installed.

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Apple's router. The process of setting up and administering DCA's PC gateways is more difficult than it would be on a Mac.

#### **Upgrades for Netway**

Tri-Data has announced two new boards that fit in its Netway 2000 SDLC gateway: an Ethernet LAN interface (\$2,795) and a token-ring LAN interface (\$3,695). These products let you connect EtherTalk and TokenTalk LANs directly to the Netway 2000 gateway server. Previously, only LocalTalk LANs could connect directly to the Netway unit; connecting other LAN types required a router.

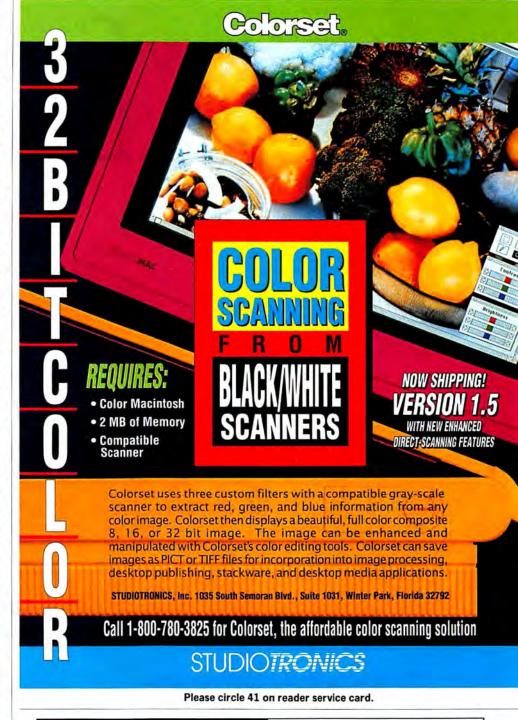
The new cards provide AppleTalk routing, and each uses an on-card 68020 microprocessor and 512K of RAM. In addition to performing its SDLC gateway functions, the Netway 2000 can double as an AppleTalk router. Mixed AppleTalk Phase 1/Phase 2 networks are supported by the Ethernet card.

For some time, Avatar and DCA have had APIs (application-program interfaces) that let programmers write HyperCard front ends for 3270-mainframe software. Recently Tri-Data began shipping an API for the MitemView programming environment (see "Face to Face with Your Mainframe," February '90, page 276). In addition to creating easy-to-use graphical front ends, you can write front ends, using MitemView, that allow users simultaneous access to multiple hosts.

With the announcement of the Avatar and DCA SDLC gateways, Tri-Data's Netway has lost some of its advantages. For example, DCA now supports the highest number of simultaneous mainframe sessions. All three companies support up to 64 users, but DCA is the only vendor that can support up to 128 simultaneous sessions. Netway can no longer claim to have the cheapest per-node cost of any mainframe-connectivity system; a Netway 2000 with a token-ring card costs slightly less than \$13,700, approximately as much as the newer systems (including the CPUs) cost. Avatar now offers the greatest variety of systems. It is presently the only vendor with a coax gateway, one of the fastest means of connecting to a mainframe.

Avatar, 65 South St., Hopkinton, MA 01748; (508) 435-3000. DCA, 1000 Alderman Drive, Alpharetta, GA 30201; (404) 442-4000. Tri-Data Systems, 3270 Scott Blvd., Santa Clara, CA 95054; (408) 727-3270.

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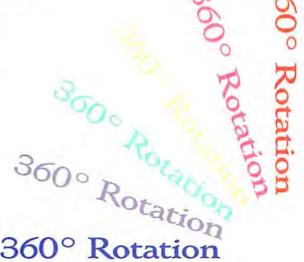
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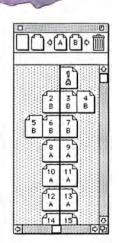
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# **POWER TOOLS**

EDITED BY JAMES BRADBURY

### **Build Your Own Tables**

Here's how to create high-quality tables with software you probably already own. nyone with page-layout, table-making, or presentation software—and a few hours to spend—can produce slick, professional tables. But suppose all you want to produce are occasional tables for reports, documents, or presentations? Fortunately, you can create high-quality tables with software most Mac users already have: spread-sheet programs, word processors, and/or drawing programs.

The two tables in this article were created with this type of software. Table 1 has a basic row-and-column format. Table 2 is a much

more complicated design that required a combination of software features to produce.

#### Starting with Spreadsheets

Spreadsheet programs, with their row-andcolumn grids, are a natural starting point for any table. They offer the most efficient means of entering data, rearranging or sorting, justifying columns, formatting numbers, and including borders and lines within a table. For simple tables, a spreadsheet program may be all you need.

Spreadsheet programs have a number of limitations that make it difficult to create more-

#### Jake's Antique Triumph Parts, Inc.

You can create horizontal lines with a word processor by applying the underline style to spaces or pressing the underline key. You can make slightly heavier lines by adding the boldface style. The heavier line was formed with the underline key with bold and underline styles. (Results may vary for different fonts.)

Spreadsheet programs are good for data entry, sorting, and arranging rows and columns as well as formatting numbers and dates.

Part #	Part name	Unit price	Description
1021	Headlights	\$6.00	6-in, round, high/low beam
1022	Windshield-wiper motor	\$75.00	Reciprocating
1023	Right front fender	\$50.00	Right front fender, used, only sligh surface rust, red
1024	Carpet set	\$87.00	Black, long-nap wool, new
1025	Bucket seat	\$50.00	Sold in pairs, genuine leather,
			brown, no cracks
1026	Speedometer	- \$40.00	0 to 140
1027	Tachometer	\$40.00	0 to 6,000 rpm, redline @ 5,000
1028	Enel gauge	\$95.00	3 terminal
1029	Ammeter	\$25.00	Center scale
1030	Oil-pressure gauge	\$75.00	Rebuilt, new pressure tube
1031	Temperature gauge	\$60.00	European centigrade scale
1032	Instrument package	\$300.00	Items 1026 - 1031 — Discount
1			package available for limited time

Word 4.0 and Nisus 2.03 support rectangular cutting and pasting, which helps in rearranging columns.

of fonly one of your columns has multiple lines of text, make it the last column, if possible. This greatly reduces the need for retabbing if the text is edited.

Table 1: The data for Jake's Parts was entered in Excel 2.2, where the numbers were formatted. The spreadsheet was saved as a text file and opened in WriteNow 2.0, where tab stops, lines, and other formatting touches were added.



complicated tables with them. Table 2 illustrates some effects that are hard for a spread-sheet program to handle: graphics, subcolumns, varied text styles, and multiple lines of text within a cell. Even spreadsheet programs that claim to have page-layout capabilities require a steep and time-consuming learning curve for such effects. You can create multiple lines of text with either text or paragraph blocks. for example, but you'll find that arranging and aligning the blocks is even harder than with a drawing program.

Nevertheless, spreadsheets remain a good starting point for producing even these complicated tables. You can use the Copy Picture command (Copy in Wingz 1.1, Shift-Copy in Excel 2.2, Option-Copy in Full Impact 1.1) to export data in PICT format to a drawing program (or the drawing layer of the word

graphic elements. Because

FullWrite's drawing layer is inde-

pendent of the page, placing

graphics within a table is difficult.

processors FullWrite Professional 1.1 or Nisus 2.03). Each cell now becomes a separate editable text block to which you can add styling and graphics. You can also use Copy Picture to paste simple finished tables directly into a word-processing document. Alternatively, you can save the spreadsheet data as a text file, open it with any word processor, and adjust the tab settings.

#### **Working with Word Processors**

Although only Microsoft Word 4.0 has a built-in table function (see the "Word 4, Page-Maker, 3.02" sidebar), other word processors

create a text block, and type them

in or copy them as a PICT file from

a word processor.

### By Linda Iroff and Nadine Iroff

Write to

Power Tools, c/o *MacUser* 950 Tower Lane, 18th Floor Foster City, CA 94404

#### Comparison of Activation Energies and Rate Constants for Clusters in Solution and Clusters Supported on Carbon

100	Decomposition on C in He	Substitution in solution	Decomposition on C in He	Substitution in solution
Os <sub>3</sub> (CO) <sub>12</sub>	0.00015	0.00007	27 – 29	32 – 39
Ru <sub>3</sub> (CO) <sub>12</sub>	0.06	0.1-0.2	20 - 21	25 - 32
Fe <sub>3</sub> (CO) <sub>12</sub>	0.50	0.3 - 2.0	18	22 – 30

Table 2: This comparison table was produced in Canvas. One text block was created and duplicated in approximate positions. The text in each block was then edited, and the Hi-Low font was used for subscripts and superscripts (see the "Hi-Low World" sidebar). Frequent grouping, ungrouping, and alignment commands were needed to adjust the table.

Even complicated tables are easy to format with the Table feature in Word 4. Columns can be merged to produce subcolumns, but rows cannot be similarly joined. Graphics must fit within one cell block.

Drawing programs are good for setting up short tables with a variety of visual elements (lines, boxes, and graphics), but data entry is a nuisance. Data can be entered into a spreadsheet and then copied or pasted into the drawing program, but make sure you hide the grids and headings first.

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By CalComp

## Everything else is just a mouse!

#### **POWER TOOLS**



#### Word 4, PageMaker 3.02

Word 4's built-in table-making feature is one of its most attractive features, but if

you want to place a Word 4 table onto a PageMaker page, you need to know some special tricks.

For starters, the earliest version of PageMaker that accepts any Word 4 file is 3.02. The upcoming PageMaker 4 doesn't add any more support for Word

tables, so the following techniques should prove useful with it too. Depending on the complexity of your table, you can place it by using one of two methods.

If you have a simple table with no more than a single line for each row in the table,

insert a hidden character (apply the Hidden style to a character) in the last line of text before

Page Maker 3.02

you place the table. This lets you place the table with PageMaker's Place command. PageMaker formats each row of the table as a paragraph and retains the styles you applied in Word. You need to reset the tabs and indents with PageMaker, though, because they aren't preserved.

For more-complicated tables with more than one line per row, the best method is to select the table in Word and use the Copy as Picture command (Command-Option-D) to copy it to the Clipboard as a PICT graphic. You can then paste the table into PageMaker as a graphic.

Note: Because of an anomaly in Word 4, be sure to copy only the table and not any other text. Otherwise, you'll get the text without the table when you place it in Page-Maker. What's the easiest way to select just a table and no text? Option-double-click inside the table. If you want to copy both ordinary text and table text to Page-Maker, do each one separately.

The disadvantage of placing a table as a PICT graphic in PageMaker is that you can't edit it in PageMaker; any changes have to be made in Word, and the table has to be placed again. On the other hand, all your text formatting (including tabs and indents) is retained exactly as it appears in Word.

are capable of handling simple tables too. Using tabs to format columns is straightforward if the amount of text information in each cell is small. If you have multiple lines of text, though, modifying and editing are extremely difficult. Lengthening text strings or inserting new columns often requires resetting many tabs and/or cutting and pasting text strings.

Particular strengths of word processors include dealing with multiple styles and fonts, checking spelling, and searching/replacing. Most word processors share the inability to rearrange columns easily, to draw vertical lines or boxes around cells, or to position imported graphics properly.

Word 4 has a Copy as Picture command (Command-Option-D) that's the equivalent of spreadsheet programs' Copy Picture command. With word processors that don't have such commands, you can get the same results by using print-to-disk utilities such as Solutions International's SuperGLUE II. When you paste text into your drawing program that you've copied this way, each segment of text (a line within a column) becomes a separate text block, retaining the text style and spacing from the word processor. Superscript and subscript text are also separate text blocks.

#### Dealing with Drawing Programs

The ability to draw lines and boxes and to position graphics makes a drawing program the natural tool for creating complicated tables. To handle the text, enter each cell as a separate text block. Crude alignment and duplication of text blocks, followed by editing within the blocks, makes creating the basic table design simple, but you'll need to rely on tedious grouping/ungrouping and multiple alignment commands to adjust the final look of the table. Using the Copy Picture command from within a spreadsheet program is a good way to

eliminate much of this tedious work.

Most drawing programs now support multiple fonts and styles within a text block. Unfortunately, the lack of subscripting and superscripting in drawing programs is a serious drawback for technical tables (see the "Hi-Low World" sidebar). However, multiple-line text within a block can be easily rewrapped as the column width/height changes.

Drawing programs make the exact placement of graphics and lines easy. Graphics can either be created in the drawing program or imported and resized. Variable line thicknesses can highlight the table.

#### **Setting the Table**

The best approach for creating tables depends on their complexity. Spreadsheet programs are the software of choice for producing simple tables that don't require special text formatting or graphics. The Copy Picture com-

mand in most spreadsheets lets you easily incorporate simple tables into a text document. Word processors are a good second choice for making a simple table, especially if it has few columns and you don't want vertical lines. Word processors also handle a greater variety of text styles and can better handle subcolumns.

Although you can use a drawing program to handle any graphic elements needed in a table, it isn't a good data-entry tool. If you have to make a complicated table, the best approach is to create the text in either a spreadsheet program or a word processor and then paste it into a drawing program. Graphic features can then be added easily. The final table can be printed or pasted into your word-processing document.

Spreadsheet programs are the software of choice for producing simple tables that don't require special text formatting or graphics.

#### Hi-Low World

A major problem with using spreadsheet or drawing programs to produce technical tables is that subscript and superscript text styles aren't available in either type of application.

Fortunately, Bruce Long (Department of Mathematics, Arizona State University, Tempe, AZ 85287-1804) has created the freeware PostScript font Hi-Low, which generates subscript and superscript Times and Symbol characters. This font greatly simplifies the creation of scientific tables (such as Table 2) in drawing programs that allow multiple fonts within a single text block (including Canvas 2.0, MacDraw II, and SuperPaint 2.0).



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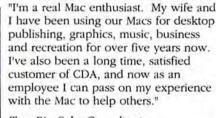
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# The Perils of Prediction

n the April issue, I asked who said the following:

"If you now own the standard 128K Mac, don't believe for an instant that your computer is obsolete. You may discover that you don't need the deluxe model. You may only need a second disk drive and software that uses techniques such as virtual memory . . . ."

The optimist was Danny Goodman, writing in Macworld in November 1984, on the announcement of the long-awaited 512K Fat Mac. With hindsight, Danny's prediction looks silly and the reference to virtual memory is particularly interesting — have we really been waiting for VM for more than five years?

System-based virtual memory is still a promise, one that won't be fulfilled anytime soon. But to be fair to Danny, the kind of virtual memory he had in mind — individual applications swapping documents in and out of memory as they need them — has been around for years. The System-level virtual memory in the works for System 7 won't really arrive

until applications are updated to take advantage of it, after Apple releases it as part of System 7 — and it isn't even planned for the initial release of System 7 this fall.

In fact, the 128K Mac with a single disk drive was obsolete the minute a better alternative was available. Getting any serious work done on the 128K machine was nearly impossible. Since then, Apple officially declared the

# **By Michael Swaine**

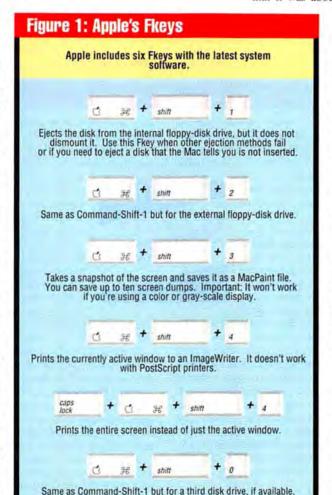


Figure 1: Apple includes six Fkeys with the latest system software. Contrary to popular belief, they have nothing to do with the function keys on the extended keyboard.

512K Mac itself obsolete and has now made it clear that every 1-megabyte Mac will soon be yesterday's technology.

But Danny's no dummy. Anyone who tries to predict the future occasionally looks silly. Who would have predicted in 1984 that the Berlin Wall would soon be on sale in souvenir shops? In 1984, with Apple still living off Apple II profits, who would have predicted that it was about to embark on a relentless

assault on its own installed base? Not me. Still, the pundits continue to put their reputations on the line. See this month's puzzle, "Is Your Mac II Obsolete?"

It's not hard to predict the future for owners of obsolete computers, though. Here's the seamy scenario: All the software that will ever run on your CPU has already been written, none of it will ever be upgraded, and you will find it increasingly difficult to get parts or repairs for your machine.

The least a system-software columnist can do is talk about compatibility issues for old machines. In the coming months, I'll try to address the classic Macintoshes. You can help by sending in your observations about compatibility and tips for using older machines.

### **Fkeys Are Not Fkeys**

Fkeys, contrary to popular belief, aren't obsolete. Apple provided a tweak to one of its supplied Fkeys in the latest system-software update (6.0.4). Also contrary to popular belief, Fkeys don't have anything to do with the extended-keyboard keys labeled F1, F2, and the like.

And contrary to my own sloppy error in a past issue, the operations Cut, Copy, and Paste are not Fkeys.

Obviously, some of us need educating regarding Fkeys, and it's worth the effort, since Fkeys are useful.

Fkeys are utility programs, as are DAs, cdevs, and INITs. You invoke an Fkey by pressing Command-Shift-#, where # is a one-digit number. Apple supplied Fkeys with the original Mac as a nod to the function keys then in common use on other computers. When Apple

later introduced an extended keyboard with keys labeled F1, F2, and so on, it was again hedging its bet on the Mac's user interface: The extended keyboard wasn't intended for people running the Mac's native operating system but rather for people running MS-DOS (with a 286 card) or maybe UNIX (Apple's A/UX, that is). Because Apple didn't do a good job of predicting the customer base for its extended keyboard, those function keys never got connected with Fkeys, as any fool can plainly see they should be.

You are able to assign functions to the extended keyboard's function keys by recording macros. Keep It Simple Software sells a package of macros for all 12 unassigned function keys alone or in combination with the Shift, Option, or Command key, along with a keyboard template to help you remember what they all mean.

Fkeys are not macros, though. Although it's easy enough to write a macro that invokes the Control Panel and turns color on or off, the macro saves you only effort, not time. Bill Steinberg's Fkey Switch-A-Roo toggles color on and off almost instantaneously.

Switch-A-Roo is typical of what Fkeys

do. They don't generally engage you in dialogue; they just toggle a feature or perform some function and then get out of the way. Steinberg has also written an Fkey, SetSoundFKey, for adjusting the sound level. Using it requires you to enter the Command-Shift-# combination followed by a number from 1 to 7. You don't type a carriage return; the sound level is set immediately.

The most familiar Fkeys are the ones Apple has supplied since 1984: Command-Shift-1 to eject the disk in the internal drive, Command-Shift-2 to eject the disk in the external drive, Command-

# System 7: Is It Worth the Cost?

Table 1 shows the hardware you'll need to enjoy the benefits of System 7. Basically, if you want to run System 7, you'll need at least the equivalent of a 2-megabyte Mac Plus, and for virtual memory, you'll need a machine with a 68030 processor or a Mac II with a

PMMU (Paged Memory Management Unit) chip. Unless your Macintosh is fairly new or has already been upgraded, System 7 is going to cost you something.

Is it worth the cost? Do you really need to upgrade to System 7? Probably, because Apple is firmly committed to making System 7 the single standard Mac operating system, and, as suggested in this month's Beating the System, being left in the camp of the obsclete is no fun. But Apple is also encouraging application developers to develop smart

binaries — that is, applications that determine the features of the machine they're running on, including the current system-software version, and configure themselves appropriately. Apple is doing more than talking about this: Something called Gestalt is now available to provide an application with just this sort of configuration information. Smart binaries would run under either System 7 or 6, possibly with some features left unimplemented under the older System. This approach has some advantages for developers and will probably add to the life of System 6. But ultimately, yes, you'll want System 7. Assuming a September release and allowing for bugs in the initial release, January 1991 will probably be a good time for those who have the necessary hardware to upgrade.

### Do You Want Virtual Memory?

Virtual memory is another matter. Many Mac models can't support virtual memory, and you may have to spend significantly more to upgrade to VM-supporting hardware. Is it worth it?

Virtual memory is a technique for swapping data between the hard disk and memory to trick the System into thinking that you have as much memory as you have disk space. Well, not quite. On most Macs, significantly less than 16 megabytes of your hard disk can be used for VM. The rule is 14 megabytes minus 1 megabyte for each NuBus card. For the SE/30, that means 14 megabytes; for the Mac II, which has at minimum a video card, no more than 13 megabytes can be used. The exceptions are the IIci and IIfx, on which VM will simulate nearly a gigabyte of memory, if you've got the disk space. In no case, however, can any single application (not including its data) make use of more than 8 megabytes of VM. So

even though VM increases the apparent size of your memory, which is something we can all benefit from, it's by no means unlimited.

You'll be able to turn VM on or off under System 7 by using a cdev, so acquiring VM isn't an irrevocable decision; it's just a tool that you can

use at will. Will it introduce new compatibility problems? Initially, no doubt. VM may have problems with some current software, particularly programs that use drivers, and some current NuBus master cards may conflict with VM.

Although VM fools the System, it might not fool you. VM can't make disk accesses proceed as quickly as memory accesses, so you may notice jerkiness as VM pulls in data from the hard disk. As a result, some software won't be appropriate for VM, especially software — such as music or animation programs — that

requires a degree of real-time performance. Such applications may alert you to turn off VM, since they can't do it themselves.

Do you want VM? The answer is, if VM would cost you, wait to see if you actually need it; otherwise there's no disadvantage in having it on hand, and there will definitely be advantages.

### Wanna Be a Programmer?

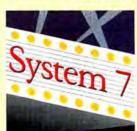
Another feature often discussed in the same breath as System 7 is AppleScript, Apple's planned user-programming language. AppleScript will definitely cost something: the time spent learning to use it. Do you want to expend the effort to learn AppleScript?

User programming has been a long time coming. In 1984, users and programmers were two distinct groups. They didn't even use the same computer, since you had to develop Mac software on a Lisa back then. During the past six years, Apple and third-party Mac vendors have offered more power to users, while at the same time, better development tools and system documentation have brought more ease of use to programmers. When AppleScript arrives, the convergence will be complete: Users will be able to program their Macs.

To someone who just wants to get the most out of the Macintosh, this may seem to beg the question, that question being "Do I really want to become a programmer?" Surprisingly, perhaps, the answer is probably yes

The idea of user programming may conjure up images of IBM's jobcontrol language, JCL. Echoes of JCL still reverberate in MS-DOS and UNIX batch processing. AppleScript will look quite different from such past models, however.

What will AppleScript look like? Apple has given us an example of a





Shift-3 to dump the screen to a file, and Command-Shift-4 to print the screen to an ImageWriter (see Figure 1).

Switch-A-Roo is a better example than Apple's screen-dump Fkey of what Fkeys are for. Fkey 3 has always had conflicts with other software, because it manipulates large graphics that tie up memory. Ideally, an Fkey should toggle some hardware switch or set some value that doesn't fight for memory. Switch-A-Roo fits that criterion perfectly. Switch-A-Roo is a typical Fkey in another way: It's free. Most Fkeys are free and can be found on on-line services such as Compu-



Figure 2: You can put your System Folder in order by using Guy Fiems' Tidy It Up! shareware program. Not only does it organize your files, but it also gives you a convenient place to store System files that you don't want to keep active all the time.

user programming language. HyperTalk, the language of HyperCard, is the best existing model of what AppleScript is likely to look and feel like.

In HyperTalk you use English-like vocabulary and syntax such as "put the name of this card before the first line of field 9" or "add dailyTotal to weeklyTotal." HyperTalk is forgiving, so if you drop a the, it probably won't complain. If you leave out substantive information, it will assume logical default values. The HyperTalk interpreter tries very hard to make sense of what you've typed, generally giving up only if the material is genuinely ambiguous or meaningless. The result is a far cry from the

model of programming you may have if you were exposed to it a few years ago, a model based largely on unsatisfactory dialogues between the programmer and the language's error-message system.

Unless Apple messes up badly, AppleScript will be at least as English-like and forgiving as HyperTalk is. It won't actually be HyperTalk, though, because the domain HyperTalk knows about is not the domain that AppleScript will need to know about. HyperTalk's vocabulary is full of cards and stacks and other HyperCard entities. AppleScript will have to know about applications, documents, and events pertaining to them.

The programming paradigm underlying both HyperTalk and AppleScript is event-driven programming. In this type of programming, the programmer identifies interesting things that can happen and specifies actions to be taken when they occur.

In HyperTalk, these events can include such things as pressing the mouse button, pressing a key, opening a stack or card, or passing the cursor over a text field or button. The programmer is free to define appropriate actions to be taken in response to any of these events but is not required to deal with any of them. Although the actions can be highly complex programs of HyperTalk commands, they are often single HyperTalk commands or short sequences.

The events underlying AppleScript will be a set of systemwide events, called AppleEvents,

that Apple is defining. AppleEvents will include many fundamental operations at the System level and within applications, such as opening and closing files or windows. Basing AppleScript on AppleEvents should give the user a great deal of power over the System and applications, because AppleEvents are also central to interapplication communication under System 7. The same technology that will permit application developers to create sophisticated interactions among applications will also underlie this user programming language.

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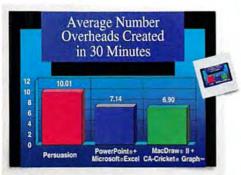


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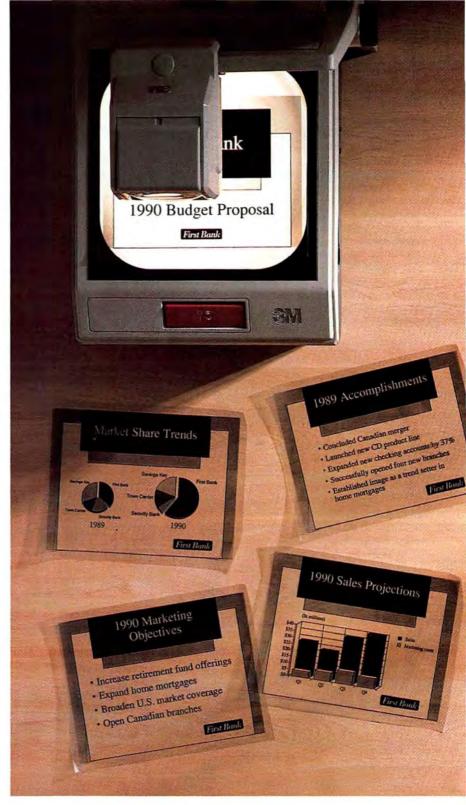
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Serve. Unfortunately, many are worth what they cost. Switch-A-Roo is good, as is Steinberg's SetSoundFKey, but you should test any Fkey before relying on it.

I don't recommend installing Fkeys in your System file unless and until you've done this. Fortunately, utility-management products such as Suitcase II and MasterJuggler support Fkeys in separate files. Once you've tested an Fkey, you can use a shareware utility such as Fkey Manager or even ResEdit to install it in your System file, although Fkeys work just as well in suitcases.

Because they require you to memorize an arbitrary and cryptic key combination, Fkeys are of limited usefulness in the Mac interface. But they do have a place, and precisely because they are non-mnemonic, they're appropriate for some of the most common operations you perform on the Macintosh. The key to effective Fkey use is to use only the ones you need so often that they become second nature. You can probably name half a dozen operations that would be easier with a key. Those are your potential Fkeys.

### Clean and Sober

I have written here before about ways to tidy up the System Folder. From Belgium, Guy Fiems sent a shareware program that does just this. Steve Bobker mentioned Tidy It Up! in Bobker's Dozen in May. At first 1 was skeptical. Does anyone really need a program to rearrange the files in a folder? Wouldn't it be faster to do it by hand? Then there was the question of compatibility with the custom desktop layout I had created with Layout (Michael O'Connor's free utility, the latest version of which is 1.9). But in the end, the power and seamlessness of Tidy It Up! overcame all my objections.

First, it works cleanly. You tell Tidy It Up! to tidy up your System Folder, and it arranges System files in functional groupings, alphabetizing the files within groupings, creating dummy folders to serve as headers, and coloring files to indicate their function (see Figure 2).

Second, you can customize the way Tidy It Up! decides what goes where. You don't have to worry about this feature; you can just use the defaults, but you can also set up your own rules for organizing your System Folder, basing these rules on two things: the file type and the creator. You don't have to know what these things mean either: Although you can type in and edit the rules, generally you just place the filenames into the categories you want, and Tidy It Up! produces a rule to codify what you've done. You won't want to spend a lot of time doing this setup, but once you've finished, it should require only occasional updating.

Using the power of Tidy It Up! requires some care. It's possible to choose settings for icon spacing that don't match your Finder's; if you avoid doing this,



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however, you'll retain compatibility with the Finder's Clean Up menu option.

One undocumented feature of Tidy It Up! is its ability to organize not only the static layout of the System Folder but also the process of testing for INIT, DA, cdev, and Fkey conflicts. Here's how that works: Tidy It Up! creates dummy folders to serve as headers, and they turn out to be the best place to keep temporarily disabled INITs and other utilities. Rather

than moving things into and out of the System Folder to test for conflicts, you move them into and out of appropriately labeled folders in the System Folder. It's surprising how this simplifies the process of resolving INIT conflicts. You can find Tidy It Up! on many online services or order it directly for \$15 (\$20 if you want to get the next update) from Guy Fiems, 77 av. Leopold III, 1970 Wezembeek-Oppem, Belgium. I predict you'll find Tidy It Up! useful.

# ls Your Mac II Obsolete?....



Since the basic Macintosh II went out of production in March 1989 and disappeared from Apple price lists in January 1990, it takes some courage to claim that the machine is not obsolete. This month's puzzle demonstrates that prognosticative courage is not dead.

The first person to send the correct answer will receive an "I Beat the System" T-shirt

In what publication did the following prediction appear one month after the Mac II went off Apple's price lists, and over what byline?:

"... the three-year-old Macintosh
II is still a workhorse and not an
ancient relic that needs to be consigned to the storage closet or passed
down to the kids."



Send your solution to: Michael Swaine c/o *MacUser* 950 Tower Lane 18th Floor Foster City, CA 94404

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When you place this printer next to your Mac, you'll be impressed by its small size and compact design. At only 13.4 inches wide and 14.2 inches deep, microLaser may be the small kid on the block, but it packs plenty of punch. This six-page-per-minute printer takes full advantage of virtually all of the software

that runs on your Macintosh. That's because it uses the Adobe PostScript language, offers 35 PostScript typefaces,

1.5 Mb of memory and an AppleTalk<sup>®</sup> interface.

If you also use MS-DOS® Computers, you can switch between the PostScript language and standard HP LaserJet® Series II emulation easily without turning off the printer.

# True Adobe PostScript.

Because microLaser features the PostScript language, you can print fonts in a variety of typestyles, sizes, and orientations by scaling and rotating them to meet your exact specifications.

The PostScript language also gives

you more graphics power so you can print precise lines and smooth curves. Integrating text and graphics is easy, and the microLaser can print even your most sophisticated page layouts and illustrations.

What's more, the PostScript language is the industry standard for higher resolution output devices. So you can proof your documents on the microLaser, then print on any typesetter with PostScript capability without recreating the document.

# Capabilities that grow as your needs grow.

One of the best things about microLaser is that you only buy what you need. Memory is upgradeable in 1 Mb incre-

ments up to a total of 4.5 Mb, and you can upgrade it yourself, without tools or technicians. All you have to do to get additional fonts is download through software or plug optional micro-Cartridges into two credit-card size slots.

# Superior paper handling.

Part of what makes microLaser a truly personal, desktop laser printer that takes up so little room is its paper drawer, which slides inside. Because microLaser holds 250 sheets standard (it holds 500 when you add an optional paper drawer), you spend less time refilling paper and more time creating superb-looking documents.

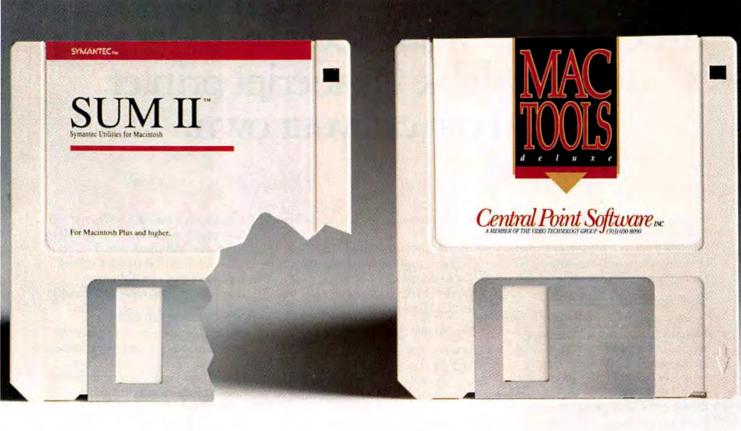
This printer also handles a variety of paper sizes and types — from letter, legal, and executive to transparencies, labels and envelopes. For those times when you're facing a large mail merge task, just plug in an optional envelope feeder to alternate, between letters and envelopes.

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To find out more about how you can have affordable PostScript printing for your Macintosh, call TI today. 1-800-527-3500.

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All.

Why settle for an incomplete set of utilities when you can have them all? Introducing MacTools® Deluxe—the most comprehensive, powerful collection ever assembled for the Macintosh.

It lets you find misplaced files, recover crashed disks, undelete trashed files, backup your data, optimize volumes, secure files and folders, quickly copy floppies, organize folders, and even partition your hard disk.

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# **Fax Reform**

Every modern office needs to send faxes — can a fax modem handle the job?

here's a fine line between a new technology's being useful and its being a waste of time. Every now and then, you come across one that sits right on that line, causing you alternately to praise it and swear at it.

Right now, my fax modem sits on that line, and I'm not sure which way it's headed. Will it continue to frustrate me, or will it develop into a useful tool? I'm not willing to wager on either possibility yet, so be forewarned if you find yourself starting to buy the standard marketing line about fax modems ("Why spend hundreds on a dedicated fax when your computer can do all the work?"). I bought that line a year ago and now find myself with a YAPCD (Yet Another Problematic Computer Device).

Faxes, of course, are the hot new productivity booster in business. Federal Express made its reputation several years ago by promoting the concept of "when you absolutely, positively, have to have it overnight." Well, faxing beats the good of Fed Ex courier by a full day. And since many overnight deliveries consist of only a few

pages or documents, it made sense for faxing to become the de rigueur way to send printed material to someone else in the least amount of time. (Fax advertisements often claim to have

By Thom Hogan



Both conventional fax machines and a Macintosh fax system have advantages. 10-to-15-second transmission times for a single page, but I've yet to find a reasonably priced machine that averages that in real life. Nevertheless, most — even my 4,800-bps Abaton InterFax — average considerably less than a minute per page.)

### **Fax Satisfaction**

But let's think about this for a minute. Most businesses are sending printed documents with fax machines when they need to deliver some-

thing quickly. And most business documents are generated now by a computer. Aha! Let's skip the middleman and just have the computer fax the document. You skip the steps of printing the information on paper and then feeding that paper into another machine. We'll save a few trees and cut another minute off the time it takes to get information from point A to point B!

And that's just what fax modems purport to do. The fax modem is selected with the Chooser. Whenever I want to fax something, I call up the Chooser, select the FaxModem driver, and then use Command-P to print the document. When the Print dialog box comes up, I fill in the transmission time and the name and number of the recipient and click on the OK button. The faxing takes place in the background, so I'm able to do other work. (Be careful here: Some fax modems, such as Apple's, don't come with software that allows background transmission. If you get one of these, check out Solutions' Back-Fax program, which adds this very necessary capability; but read further.)

A side benefit of generating faxes with a computer is that they show up at the other end of the transmission spar-

kling clear (no messy scanning noise or crooked alignment). Indeed, some people who have received a fax from me have remarked on how clear it was. They're usually also quite disappointed when I tell them my fax machine — a Mac II with 5 megabytes of RAM, a 260-megabyte hard disk, and so on — cost \$8,500.



# With a simple 11-digit code, you can access virtually every computer in your corporation.

No, this isn't an appeal to some bizarre group of computer hackers. Rather, it's an invitation

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By doing so, we'll send you our comprehensive report on electronic mail technology. And you'll discover how easy it is to get people communicating across the entire corporation.

Regardless of the hardware

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The reason, quite simply, is Microsoft Mail version 2.0 for AppleTalk networks has hooked up with the industry's leading connectivity vendors.

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Of course, if you already have a Mac, you can get the 4,800-bps Abaton unit for as little as \$250 - about half the price of a low-end dedicated fax machine. And it works as a 1,200-bps modem too, so you seem to get a lot of equipment for your dollar. More recently, Orchid Technology sent me its MacFAX modem, which operates at 9,600 bps as a fax and at 2,400 bps as a modem and even has a special fax-modem-to-fax-modem data mode that works at 9,600 bps. I've seen the Orchid unit priced as low as \$490, less than the cost of most dedicated machines.

but, still, the fax modem was supposed to make things happen instantaneously, not after two-hour repair jaunts. Moreover, even after being repaired, my Abaton unit often does a "stutter fax" - it has trouble connecting on the first attempt, so it redials and tries again (remember that 24¢ phone call?). In fact, it seems to stutter-fax more often than it connects on the first try. My experience is not unusual. Other fax-modem owners I've talked with have had the same experience (and not just with the InterFax). Something tells me that this is because of

# **Fax Findings**

So much for the good side of the cost/ benefit line. Let's now consider the Mr. Hyde portion of the fax modem's psyche.

We can start with the phone bill I recently received (ever wonder where I get ideas for columns?). I'm used to pretty pricey phone bills; after all, I do run a business. As I was scanning this month's seemingly endless list of calls, I came across one that startled me: a 181minute call that cost \$43.44! This was followed by a 24¢ call and a \$1.92 call to the same number. What?

Well, I recognized the phone number as being that of the fax machine at a company with which we had been locked in intense negotiations at the time. (I would never, ever spend three hours talking on the telephone.) A three-hour fax? No way - I could have faxed the entire 300-page manual for our product in that amount of time.

So I pulled up the InterFax "Delivered Mail" report. It said that two faxes, each lasting less than seven minutes, had been sent during the time the phone bill indicated. Which was right, AT&T or the InterFax? Well, a little experimentation taught me a lesson about the InterFax: It can sometimes hang up and redial before the telephone system can let go of the line and provide a new dial tone. Somehow, the fax modem had gotten into a strange loop that held the line open but didn't transmit anything useful. The folks at the company to which I had been faxing said that they had experienced weird things that day with their dedicated fax machine. I bravely explained that the problems were probably my fault.

This isn't the first problem I've experienced with a fax modem. The first unit I got died in the middle of an important fax session. I replaced that machine on a quick trip to the local ComputerWare,

# Will my fax modem continue to frustrate me, or will it develop into a useful tool?

the immaturity of the software that drives these units, but I can't be sure without spending a lot more time on the problem than I care to. The Orchid MacFAX modem I just started using has yet to stutter on a transmission.

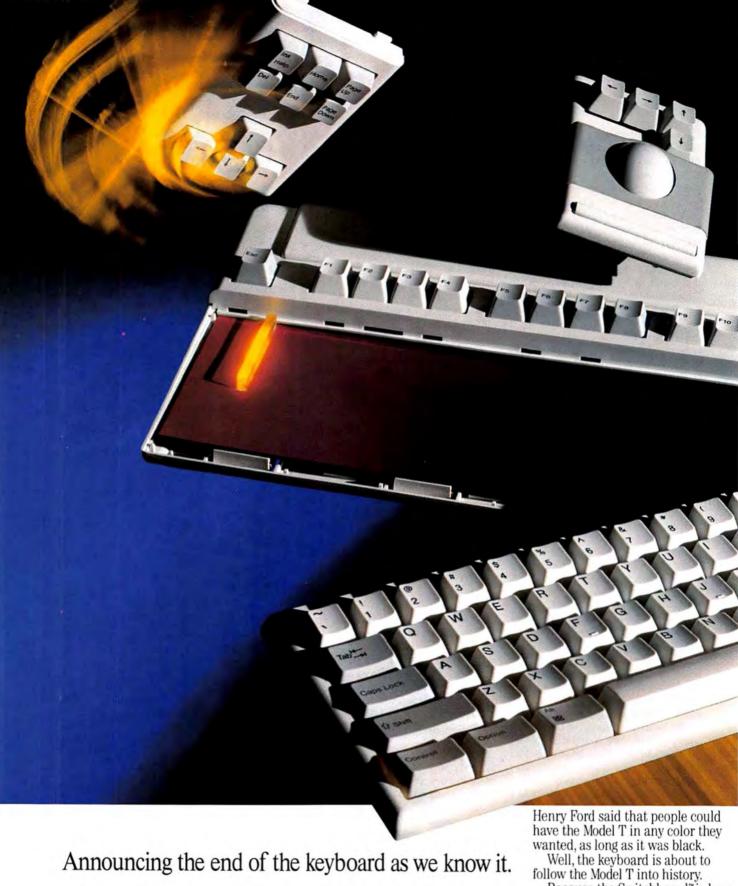
### The Soft Side

I'm not enamored of the software the fax manufacturers supply with their units. Both the Abaton InterFax INIT and the Solutions BackFax INIT, which ships with the Orchid fax modem, seem to have more than their fair share of conflicts with other cdevs and INITs. And neither program is perfect when you do get it to run. The BackFax software lets you build your own cover page (a nice touch), but it can't monitor transmissions. Indeed, you must turn the BackFax's background ability on and off with a stand-alone application, rather than with a cdev, which is what it should use. Abaton's InterFax software comes with a cdev, but it doesn't create custom cover pages.

During the fax-making process, your Mac is completely taken over by the fax modem's software. Although fax modems promise background faxing, that applies only to the transmission - you still must wait for the image to be built. BackFax lets you preview the page, which is good since it tends to chop off the right margin, but it doesn't indicate how long preparing the image for transmission will take. The InterFax software doesn't let



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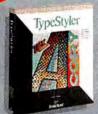
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you preview the image on the fly, doesn't seem to have the margin problems BackFax does, and gives you excellent feedback on where it is in the process and how much longer it might take.

If you have only a fax modem, you'll also be frustrated by things people with fax machines don't even think about. For example, as is becoming more common, I was faxed a legal document to sign. The sender asked to have the document faxed rather than mailed back. (Major problem: Current law makes it unlikely that a document executed via fax will be held valid. Manipulating the digital transmission is far too easy, and because of the nature of a fax transmission, there's not always an original document whose authenticity can be attested to.) My problem was simple: How do I sign a TIFF file? Yes, I know it's not impossible - many good paint and draw programs can open TIFF files — the problem was that the original had been scanned in crookedly, was of really poor image quality, and would probably lose more quality in the process of my "electronically" signing it. Besides, doing it that way is a pain. Dedicated-fax owners simply take out a pen, sign the paper, and stick it back into the machine for retransmission. I suppose I could break down and buy a scanner, but that seems to be an expensive way (both in dollars and time) to mark up faxes.

But, you know, even all these nuisances wouldn't really bother me if it weren't for larger problems behind the scenes. The most important of these I call the creeping cable clutter. I currently count 27 sets of cables. Moreover, I have boxes scattered all over the tabletops in my office. The way I figure it, I should really need only three boxes: 1. computer, 2. printer/copier/scanner, and 3. telephone/modem/fax/answering machine. I've already written about #2, which I call Skippy, and, according to a recent phone call, it looks like I may finally get my wish there - a 300-dpi PostScriptequipped printer with built-in scanner and extra hardware and software that equips it to perform both copying and fax jobs, all in a single box that attaches to your computer with one cable. Fine, I'll stop harping about Skippy. Now I'll start complaining about the phoneoriented devices.

With ISDN (digital phone networking — whose primary ability is to combine a voice call and digital transmission of

data at the same time on the same line with neither interfering with the other) in our future, it's about time to start thinking about how our computers are going to tie in to the phone lines. AT&T, IBM, and a host of other large companies already have some preconceived notions, of course, but how likely is it that those ideas are going to match what we Mac owners need?

Another problem I'll mention in passing: If I'm manipulating graphics and text on my computer with PostScript, why should my work be disfigured into a bit map by the fax modem before it's sent? Why can't the fax modem send the PostScript code embedded in the fax image? That way the receiving device could print the image at any resolution. Since current fax technology is 200 dpi and the laser printers on which I usually print fax-modem messages are 300 dpi, the results, despite being better than traditional faxes, are still much less clear than they could be.

And what about the modem side? If the fax part of these boxes can transmit at 9,600 bps, why hasn't someone made the modem side work at the same rate? The fax-machine/modem combination offered by Abaton, Orchid, and others is a start in the right direction. But what I really want is a box (or better yet, a NuBus card) that handles fax, modem, voice mail, or an answering machine and a modest number of regular telephone lines. If I have three lines coming into my office, I want this box to manage the lines so that if I'm talking on line I and start to send a fax, it automatically transmits on line 2 or 3. Likewise, if I'm faxing on line I and pick up the phone to call, it should choose line 2. And all digital communications should occur at 9,600 bps, period. When my area finally gets ISDN, my expectations are going to go even higher.

But I'm not holding my breath waiting for this magic box. Neither the phone companies nor the computer companies seem to fully understand the implications of connecting computers and phones. In the meantime, we get things such as the fax modem, which enchant us with the possibilities and mire us in the realities.

Thom Hogan is president of Macreations and editor of *The Macintosh II Report*. Sample copies can be obtained by sending \$2 to *The Macintosh II Report*, 329 Horizon Way, Pacifica, CA 94044.

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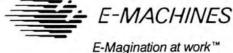
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# Managing Multiple Windows

Here's how to open multiple windows in your Mac programming world.

ast month we began Generic App, a complete, stand-alone Macintosh shell. This month we'll enhance our program, giving it the ability to control multiple document windows — a feature that Mac users have come to expect from any application.

Before we get started, it's only fair to warn you that there are some very technical passages in this month's presentation. There's not much we can do about that — windowing is a complex topic, and Apple didn't make it easy for first-timers. The good news is that you have to write this stuff only once. Every subsequent application you create can reuse the windowing code and concepts that we work through here.

If you didn't catch the first part of Generic App, don't worry — you can still get the complete application from MacUser Online or by ordering a disk from us (see the "Relief for Sore Fingers" sidebar). This month's code is in the form of a complete project folder that replaces last month's Generic (you now have two Generic Apps: one with single-window

abilities and the other with multiple-window abilities — see the "Changing a Project File" sidebar).

# Windows and Documents

Before we begin pounding out C statements, we need to get a couple of terms straight. Developers often use the words window and synonydocument mously when referring to windows. This confusion of terms arises from the so-called desktop metaphor for describing objects on the Macintosh screen. Actually, windows are on-screen objects described by a WindowRecord data structure and manipulated by calls to the Macintosh Window Manager. They represent a view on the data. A document is a complete collection of data, which can include display and file information, and the in-memory structures associated with processing this data. A document is

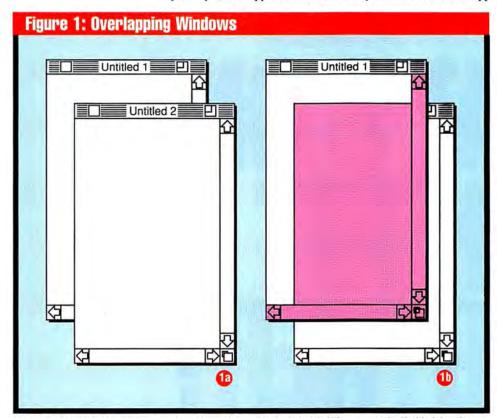


Figure 1: The Untitled 2 window overlaps Untitled 1 on the desktop (a). When you make Untitled 1 active (b), only the update region needs redrawing. Otherwise you waste precious processing time doing unnecessary work.

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not a window, but portions of (or entire) documents appear within windows.

Generic App creates a Doc data structure that is associated with each new window. The format of a Doc looks something like Example 1 (the complete data structure is in AppTypes.h in this month's Generic App project folder).

Note that we use a WindowRecord as the first member of the document structure. Window Manager routines, such as SelectWindow, require the address of a WindowRecord (a WindowPtr) as an argument. We've structured Doc so that a pointer to it (DocPtr) looks exactly like the address of a WindowRecord to the Toolbox functions. There's no need to use a variant-record mechanism (called a union in C) or to convert the document to a WindowPtr first — it's already in the correct format.

### **Managing Multiple Windows**

We've seen that screen management is fairly simple when the application has a single dedicated window (see "Hello, Programming," April '90, page 245). THINK C's console routines also provide an example of this sort of primitive window management. These routines open a single window that emulates a character terminal's screen. Console I/O is based on the character streams stdin and stdout (for you UNIX junkies), and all the stdio functions such as printf work in this screen.

Last month's Generic App also had a single output window, but we added the complexity of an About box - a second window that could overlay the main one. As Mac users, you're aware that when an About box is removed, the area under it needs to be redrawn. You may recall from last month that this redraw is triggered by an update event (we'll discuss updates in detail later). The application also needs to respond to the user's manipulation of the windows. Windows on the desktop can be resized or moved, and the application needs to adjust the interface accordingly because regions of a window previously hidden can be

revealed by such actions.

When multiple windows are involved, a user has a choice of windows to work in but is limited to working in only one at a time: the active window. The user indicates which window is active by pointing and clicking. When our program's event

loop detects a mouse click in the content region of any window, we need to call SelectWindow, the Window Manager routine that posts activate and deactivate events (they always come in pairs - one window gets activated and another gets deactivated). This routine also causes the correct window redrawing. In addition, the new active window's title area becomes highlighted. In other words, the title bar gets redrawn with distinctive stripes and the go-away and zoom boxes appear. Notice how much of this work is done for us by the Window Manager. Unfortunately, we still have some tasks left, even though SelectWindow has already taken care of many of the tough jobs.

# **Responding to Activate Events**

Once SelectWindow has posted the events, we need to respond to them in our program's event loop. Our activate function is doActivateEvent() — its purpose is to set the correct highlight state for the window. Macintosh user-

interface guidelines dictate that only the active window displays highlighted controls. (In Generic App, the window's controls are the horizontal and vertical scroll bars and their components. Other examples of controls are radio buttons or check boxes, which are normally found in dialog boxes - a subject for another discussion.)

In all deactivated windows, the controls should be unhighlighted. Our doActivateEvent () function tests whether a window is being activated

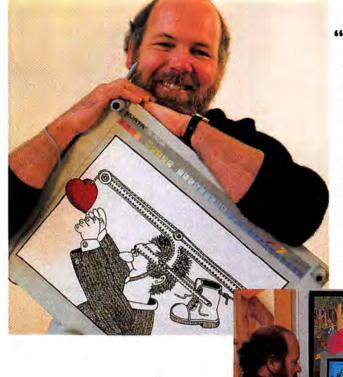
or deactivated by checking a bit in the modifiers field of the event record and highlights the window scroll bars accordingly by showing or hiding the control. Controls are kept in a linked list, so we simply step through the list, calling ShowControl or HideControl as appropriate. Notice too that we hide the pen before we do anything visual. As you'll see, we draw only when we're inside an update event. Note that we also balance the call to HidePen with a call to ShowPen before we leave the routine. Finally, we invalidate the scroll-bar areas so they'll be redrawn during the next update event, a perfect example of the mañana principle in action. "Invalidation and the mañana principle?" you ask. Read on....

### **Window Regions**

A region is a QuickDraw data structure that describes an arbitrary shape. Although it can be any shape, it is usually rectangular or made up of rectangular components. We mention regions in this discussion of windows because of their relation to the other kind of windowrelated events, update events.

Have you ever noticed how responsive the Mac interface is? Try this with any Mac application worth its salt: Bring up the About box over an open window, and then close the box. Notice that only the area under the box is redrawn. Now scroll

```
Example 2
static void
doUpdateEvent (e)
    EventRecord
                    *e:
    WindowPtr
                 theWindow;
    GrafPtr
                    savePort;
    theWindow = (WindowPtr) e->message;
    /* is my window? */
    if (((WindowPeek) theWindow)->windowKind >= 1)
       GetPort (&savePort);
       SetPort (theWindow);
       BeginUpdate (theWindow);
        EraseRgn ((WindowPeek)theWindow->visRgn);
       drawScrollBars (theWindow, true);
        drawDocContents (theWindow);
       EndUpdate (theWindow);
        SetPort (savePort);
  /* doUpdateEvent */
```



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a window. You see that only the new material is painted.

When used properly, the window-invalidation mechanism provided by routines of the Window Manager, in conjunction with the update process of the Event Manager, ensure that only the necessary areas of the screen are refreshed. Updating the entire window every time something changed would be a waste of valuable CPU time and would probably cause a noticeable delay.

### **Drawing and the Update Process**

Windows maintain an update region in their data structure. Certain Toolbox routines automatically add window space to this region as needed, such as the area under a top window that has just been closed. Other routines allow the application to add area to or subtract it from the region. When the update region is nonempty, an event is generated by ROM.

When our application gets one of these update events, we simply invoke our update handler, doUpdateEvent () (see

# **Changing a Project File**

Just a note on making changes to an existing THINK C project. Maybe you've added your own enhancements to last month's Generic App and don't want to lose your work. Certainly you don't want to replace your project folder with the new stuff; you need to integrate your work with the new project. It would make your job easier if you knew where those changes were. Most commercial developers use a technique that looks something like that in Example A.

We delimit the change with two comment strings. The opening comment string begins with a triple-hash mark (###) that makes the comment easy to search for. It also

Example

#if O

#endif

### kwgm 1.28.90 - reason why \*/

/\* old code here

### kwgm 1.28.90

new code here \*/

contains the date the change was made, the initials of the person making the change (important if you're working in a group, irrelevant if you work alone), and a comment describing the change.

clause), the new code, and a balanc-

of the change. What is important here is that you leave in the entire old code passage. It gives you something to return to if your change doesn't test out and also provides a reference for integration.

The entire change consists of the opening comment string, the old code (which gets removed from the compilation stream by the #if 0 ing comment string to mark the end

Making an effort to develop good programming habits such as this one will always pay off in the long run.

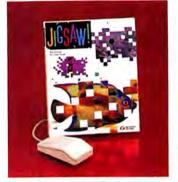


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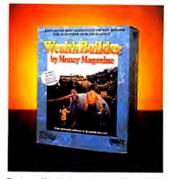
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Example 2), which draws the necessary portions of the window. How do we know what's necessary? IndoUpdateEvent (), we first call BeginUpdate. This call manipulates the GrafPort data structures so that the visible region of the port is bounded to the area defined by the update region of the window. In essence, it fools QuickDraw into thinking that the size of the port is limited to the update region. Thus, when the application draws, its rendering is limited to the update region. When drawing has been completed, the call to EndUpdate restores the port and clears this update region. Figure 1 illustrates the process.

### Invalidation and the Mañana Principle

In Macspeak, an invalid area of a window is a region that needs updating or refreshing. Likewise, a valid area is OK and doesn't require a redraw. The Toolbox supports a pair of balanced routines to validate or invalidate an area of a certain

Example B

Point mouseLoc;

(PtInRect (mouseLoc, &portRect))

window. ValidRect and ValidRgn both subtract area from a window's update region; InvalRect and InvalRgn add area to the region, so developers talk of invalidating an area of the screen that needs drawing. The trick here is not to draw an object immediately when it changes - we do the drawing only in the update function - but rather to invalidate the area bounding the object needing redrawing so that it will be drawn in a subsequent pass through the event loop. This is the fundamental canon of the mañana principle of Macintosh screen management: Never draw immediately what you can put off until the update process.

Drawing mañana improves the look and the performance of your application because all drawing occurs at the same time. Generic App has nothing in the window to speak of, so it's hard to illustrate this process in the application layer, but consider the manner in which scroll bars are drawn.

# **Zooming Windows**

When our application detects a mousedown in the zoom box, it calls doZoomBox () (see Example 3), which calls ZoomWindow, the Toolbox call that performs the actual zoom. Next, it calls moveScrollBars().ourroutine for replacing the controls at the edges of the window.

We've added a feature that we first discovered in Microsoft applications. We also zoom the window when there is a double-click in the window's title area. In order to do this, we had to explore the details of window zooming in Volume IV of Inside Macintosh. See clickZoomWindow() in WindowUtil.c to see how it works.

We then zoom the window with the part code returned from the event record (the part code tells ZoomWindow to zoom in or zoom out). Next, we invalidate the entire new port rectangle so that the window contents will be erased and redrawn. Note that we pass the address of

# Passing Parameters to Toolbox Routines

One of the most common concerns when you're using C on the Pascal-based Mac is matching the function-calling convention. There are two different ways to pass parameters in languages such as C and Pascal that maintain a stack-based function-parameter-passing mechanism.

Passing a variable by value means that a copy of the variable's con-

tents is passed to the called function. Because it is passed as a copy, the called function is free to change the variable's value without any consequences to the caller. Passing by

value gets expensive, in both time and memory, when the variable is a large data structure.

A Pascal compiler tries to optimize things by passing all parameters by reference if they are larger than 4 bytes. When a variable is passed by reference, the variable's address is placed on the stack and no copy of the data is made. Because the called function gets the address of the variable in the caller, any changes made will be reflected in the value of the variable when the function returns. (This happens in C only; Pascal safeguards against this "side effect.")

Fortunately, the compiler manages the stack for you, but it's your job to get the types of the arguments correct. Here's a rule of thumb that usually works: If the parameter is larger than 4 bytes, pass it by reference - that is, pass its address. The rationale behind this thinking is that because addresses are only 4 bytes, using them limits the maximum size of a stack parameter. This places a burden on you, the programmer — you have to know something about the data structures of the parameters of the Toolbox routines you use.

Some functions are designed to modify the contents of a variable passed to them. Pascal has a language element called a variable parameter that specifically supports this ability. You place the modifier VAR before the name of the variable in the definition of the function to signify that the parameter is a variable parameter. Every rule has an exception, and here's the exception to our rule of thumb: If a Toolbox-procedure-definition parameter has van in front of it, pass the address of the variable.

A Point is 4 bytes, so normally you pass it by value, as in Ex-

Now consider the Event Manager routine GetMouse, which is defined this way:

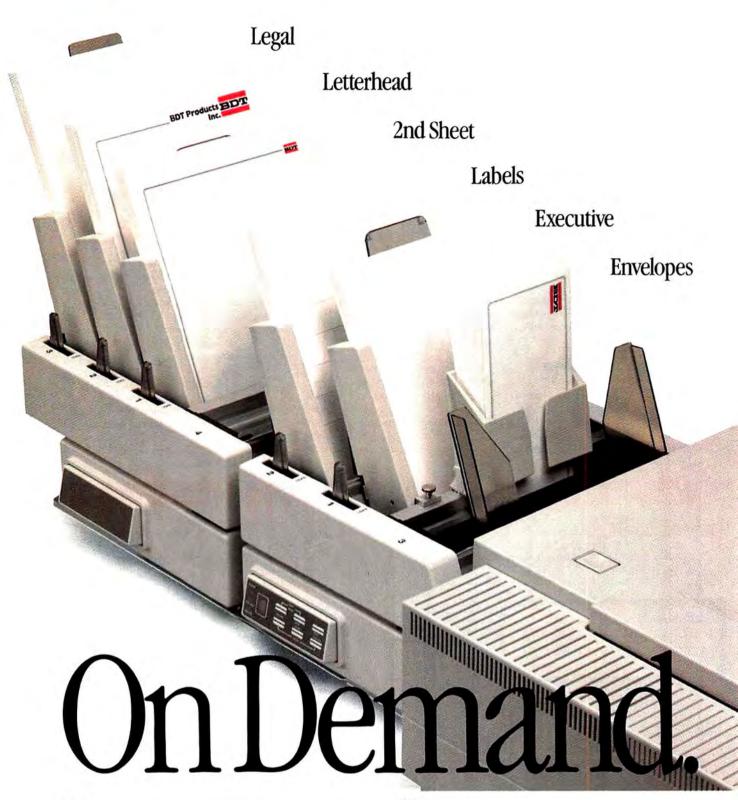
Procedure GetMouse (VAR mouseLoc: Point); This changes the way you'd pass a Point (see Example C). In the case of GetMouse, the VAR parameter demands that we pass it by reference.

C has a built-in feature, called a function prototype — whereby the compiler checks the type of the parameters that are passed to a function. To use prototypes, you must first tell the compiler to check for them. This is an option in THINK C's Compiler Flags dialog box. You must also declare prototypes for each of your

# **Example C**

Point mouseLoc: GetMouse (&mouseLoc) : if (ABS(mouseLoc.h - oldMouseLoc.h) >= kMouseLimit)

functions, but you don't have to write prototypes for the Toolbox routines you use in your program — they're built in to THINK C. Generic App and all our subsequent projects use prototypes. For the small amount of effort required up front to use them, they really pay off in saving you time you'd have to spend finding parametertype errors. We strongly recommend that you use them.



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the rectangle. See the "Passing Parameters to Toolbox Routines" sidebar if you wonder why.

#### **Resizing Windows**

Resizing a window begins with tracking the mouse in the grow icon and then sizing the window and scroll bars when the new point is selected. Scroll-bar locations are specified in the local coordinate system of the window, so when that system changes, the scroll bars need to be relocated (see Example 4).

When Generic App detects a mousedown in the grow box, it calls our handler, doGrowWindow(), with the initial mouse point. GrowWindow is the Toolbox procedure that tracks the mouse and sketches the window as the user drags the bottom corner around. We limit the growth to the size of the desktop gray region (see AppInit.c for the calculation of gGrayRgnRect). When the mouse is released, we call SizeWindow to resize the window, and then we move the scroll bars to the new window bounds. That sounds like a lot, but it's really simple; the Toolbox handles the complex stuff.

#### Dragging

Dragging a window, or should we say dragging an outline representing a window, is also controlled for us by the Toolbox — one call, DragWindow, does it all. This function does all the sketching (tracking the user's mouse) and then moves the window to the user-specified location. Because the dimensions of the window never change in this operation. we don't need to change

the scroll-bar locations in the window — all space within the window is in local coordinates. Note that the constraint rectangle here is again gGrayRgnRect —

```
void
doZoomBox (theWindow, partCode)
windowPtr theWindow;
short partCode;
{
GrafPtr savePort;
GetPort (&savePort);
SetPort (theWindow);
ZoomWindow (theWindow, partCode, false);
moveScrollBars (theWindow);
InvalRect (&theWindow->portRect);
SetPort (savePort);
} /* doZoomBox */
```

that's the entire desktop area.

#### **Coming Soon**

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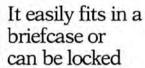
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resize them give our application added functionality, but we're not finished yet. We need to hook up the scroll bars. Scrolling is dependent on the window contents, so next month, we'll show you how to scroll both text and graphics within a window.

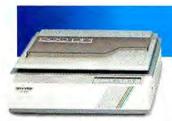
Remember to mark any modifications you make to the basic Generic App source code, as we describe in the "Changing a Project File" sidebar. It will make your integration next month a much simpler job. See you then.

#### Relief for Sore Fingers

You can get a copy of the C code for this program from MacUser Online by logging on to CompuServe and typing GO MACUSER at any ! prompt. If you are not a CompuServe user, call (800) 848-8199 or (614) 457-8600 for more information on subscribing. Alternatively, you can order the disk directly from us for \$10 by calling (800) 952-6300 and asking for Department 28.

```
Example 4
doGrowWindow (theWindow, aPt)
   WindowPtr
                 theWindow;
   Point
                 aPt:
   long
                 newSize:
                 limitRect;
   Rect
   /* erase and invalidate old scroll-bar area */
   invalScrollBars (theWindow, true);
   /* limit size of window to the available screen */
   limitRect = gGrayRgnRect;
   limitRect.left = 48;
                           /* minimum window size */
   limitRect.top = 48;
   /* track user mouse and grow the window */
   newSize = GrowWindow (theWindow, aPt, &limitRect);
   SizeWindow (theWindow, LoWord (newSize), HiWord (newSize), true);
   /* relocate scroll bars to new window bounds */
   moveScrollBars (theWindow);
   /* erase and invalidate new scroll-bar area */
   invalScrollBars (theWindow, true);
   * doGrowWindow */
```

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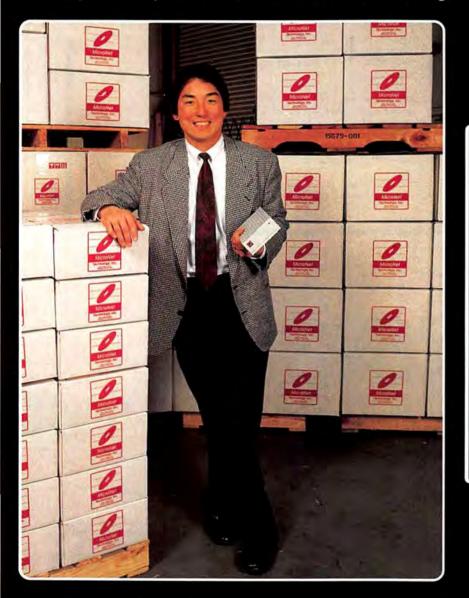
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### Tip Sheet

Readers Share Their Tips and Tricks

#### Deskton

Rebuilding the Macintosh desktop from time to time can save some hard-disk space, but it causes the comments in the Get Info boxes to be erased (see "A Guide to Get Info," April '90, page 232). Here's a way around this problem for

anyone who's comfortable with ResEdit or some other resource editor:

- 1. Start Apple File Exchange or any other program that lets you see and copy invisible files.
- 2. Make a copy of the file called Desktop, giving it a different name if the application you're using allows you to. If it doesn't, save the copy to a different folder so that you won't overwrite the original Desktop file. With Apple File Exchange, choose Rename Destination Files from

the File menu to change the

- 3. Rebuild the desktop by holding down the Option and Command keys while your Mac is starting. Just before your hard disk is mounted. you'll get a confirmation dialog box asking whether you want to rebuild the desktop. Click on OK.
- 4. Once the desktop has been rebuilt, open ResEdit and open the copy of the Desktop file that you made in step 2. Find the FCMT resource in the list of resources. This resource contains the Get Info information that was erased when the desktop was rebuilt. Select and copy it.
- 5. While still in ResEdit, open the rebuilt Desktop file

and erase everything except the letter).

You can then use that file as a template for

Illustrator 88 or FreeHand to auto-trace

line object that is nearly indistinguishable

from the original. You can then scale it be-

yond QuarkXPress' 500-point limit, use

Illustrator's blend tool, and manipulate it

in ways that you can't manipulate normal

You'll find that you can create an out-

(see Figure 1b).

Michael Clarke

Acton, MA

text.

and paste the FCMT resource into it. Now select the copy you made of the Desktop file and choose Clear from the Edit menu.

6. Ouit ResEdit, and answer Yes to "Save 'Desktop' before closing?". Your Get Info boxes will now have their comments restored.

**Greg Lentz** Twinsburg, OH

#### Expressionist

The mathematical-formatting program Expressionist works well with Microsoft Word 3.01, but it often crashes when you use it with Word 4.0. Word's new implementation of the Clipboard makes Expressionist unhappy and bombs the Mac.

A way around this problem is to avoid the standard Copy command (Command-C); instead, use the Word 4.0 Copy as Picture command (Command-Option-D), which first converts an equation into a MacDraw graphic and then places it on the Clipboard. This approach allows the powerful combination of Expressionist and Word to continue.

Tom Kreutz New York, NY

#### PageMaker

Many people prefer to enter numbers from the numeric keypad - it's faster and more accurate than using the numbers at the top of the keyboard. PageMaker won't let you enter numbers in this way, though. Its keypad numbers are only good for moving around within a document (and the Num Lock key has been disabled).

I've called my local dealer and Aldus to find out how to use my keypad for numerical entries in PageMaker 3.02, but nobody could help me. Then I stumbled upon this simple but effective solution: Use a macro program such as MacroMaker or AutoMac III to program each key on the keypad to

#### Tip of the Month

Here's a quick-and-dirty way to circumvent QuarkXPress' 500-point font-size limit and create some beautiful text effects:

1. Using QuarkXPress 2.1, with its new font-rendering extension, set the Render Limit command (on the Utilities menu) to a relatively low number, such as 48 points.

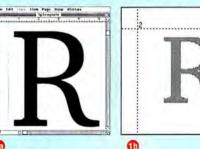
2. Select an unencrypted (Type 3) downloadable PostScript font or one of the Bitstream fonts that are distributed with QuarkXPress.

3. Choose the largest point size that fits in your window. A 500-point character, which

is the maximum size that QuarkXPress allows, usually fits on a 13-inch Apple color monitor (see Figure 1a).

4. Use the Fkey Command-Shift-3 to take a screen dump of this single letter (you may want to open the MacPaint file





Figures 1a and 1b: QuarkXPress lets you convert characters from most Type 3 or Bitstream fonts into outlines that can be treated as graphic objects. First type a character in a large point size, and then capture a screen dump of the image (a). You can use the screen dump as a template in Illustrator 88. The auto-traced outline (b) can be used in ways ordinary text cannot.

#### Compiled by Gregory Wasson

# When you need a change of face.

Now that Adobe Type Manager software has cleaned up your text, give it a change of face with Adobe TypeAlign.

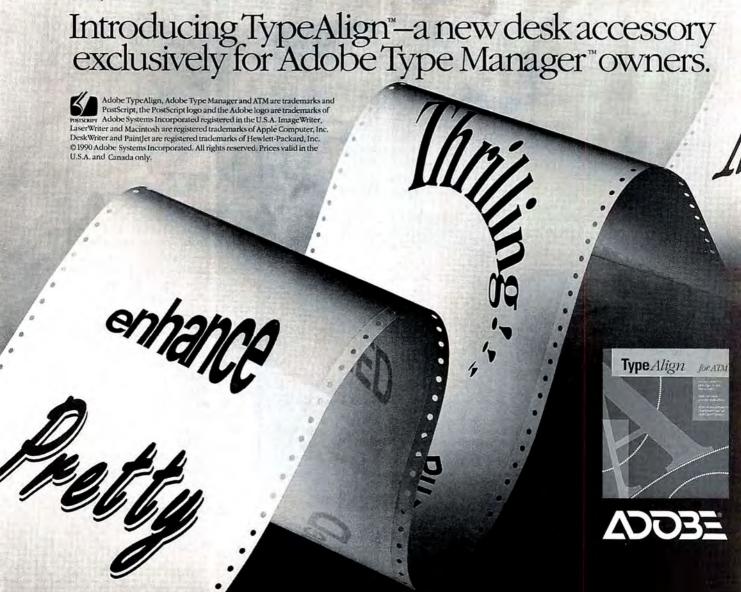
Because while ATM™ gives you great looking text, Adobe TypeAlign software allows you to print any number of different ways—up and down, at any angle, even along arcs and complex curves. And you can use inexpensive printers like ImageWriters\* DeskWriters\* and PaintJets.\* So now you don't need a laser printer to get professional-looking results.

How does Adobe TypeAlign work? First, use one of the simple tools to draw an arc, straight line or freehand curve. The freehand tool is especially handy for wrapping type around any object or shape. Then, type a word or phrase—it appears automatically on the line you just drew. You can even adjust the spacing between the letters and words until it's just the way you like it. Will a shadow or outline look even better? Give it a try—you'll see the effect instantly on screen.

You don't need to be a professional designer to use Adobe TypeAlign, either. Since it's a desk accessory, you install Adobe TypeAlign once in your Macintosh\* computer, then use it in just about any application. You'll find it incredibly easy to create even complicated-looking effects—no special drawing programs or skills needed. So go ahead, put a new face on your reports, slide presentations, charts, whatever.

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produce its corresponding number.

Bob Jones Salt Lake City, UT

#### FreeHand

With FreeHand 2.02, the most common technique for repeating elements in a closed path is to duplicate them as many times as required to fill the space, cut these elements to the Clipboard, and finally use the Paste Inside function to create the effect. However, the Tiled Fill option is faster and makes it easier to adjust the spacing of the masked elements (see Figure 2).

In the dialog box you get when you select Tiled from the Fill menu, you can modify only scaling, angle, and offset properties. The problem is that you cannot control spacing between the repeated elements of a tile. Here's a way to bypass this limitation:

- Create your tile (text, paths, and so on). Make sure your elements are ungrouped.
- 2. Draw a square or rectangle around your tile, and align all elements to the square horizontally and vertically centered (you may have to group your elements to do this easily).
- Select your square, and set the line to None on the Line menu.
- 4. Ungroup everything, and cut to the Clipboard.
- 5. Select the path to fill, choose Tiled on the Fill menu, and click on the Paste In button in the Tiled dialog box. As with the Edit menu's Paste Inside function, you won't be able to see your results unless you're in Preview mode.

If the tiled graphic you've

created doesn't tile correctly to form a pleasing pattern, you can easily change the spacing now. To edit the distance between objects, select the path, choose the Tiled command, and click on Copy Out. Paste the ungrouped elements back onto the document. You can now modify the height or width of your square to change the way the element or elements will be tiled into a pattern. Once you're satisfied, paste the ele-

ments back into your fill.
Jean-Paul Desrochers
Montreal, Quebec
Canada

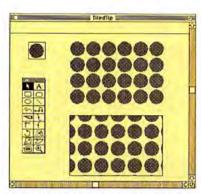
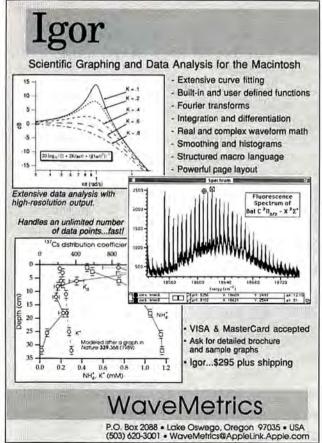


Figure 2: Instead of creating enough of a repeating shape or pattern in FreeHand to fill a closed path, use a tiled fill. Which would you rather create: the single tile on the top left or the four rows of objects on the right?

#### Ready, Set, Go!

This shortcut makes it much easier to jump to a specific spot on the page when you change view levels in Ready, Set, Go! 4.5a.





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#### EYESORE VS. EYE PROTECTION

As today's monitors get bigger and brighter, anti-glare filters become less of an option and more of a necessity.

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In fact, most filters look like they belong to someone else's system.

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If you find yourself at the Size To Fit view and you need to zero in on a text or graphic element at the Actual Size view, just hold down the Command and Option keys while clicking on a text element with the I-beam or on a graphic element with the pointer arrow. You'll automatically switch to the Actual Size view.

Albert Cunniff Catonsville, MD

#### MacroMaker

When launching applications with Apple's Macro-Maker, you may run across some instances in which it's difficult or impossible to make a macro for a simple launch. These applications may not allow access to the menu bar, or they may require you to perform some action prior to accessing the menu bar.

This restriction makes it impossible for you to stop recording as soon as the application has been launched. An example of this annoying problem in an application is the HDBackup program, which is provided with Apple hard-disk drives.

To overcome this limitation, temporarily place an empty dummy folder over the precise location of the application for which you want to create a launch macro. Then record the steps you need to go through in order to launch the application.

After the dummy folder has opened, stop the recording and save the macro. Exit from MacroMaker, and then remove the folder so that you can once again see the application on the desktop. From

now on, the application will launch nicely. This technique works because MacroMaker records the location of mouse

clicks — not the items the mouse is clicked on.

Gregory Krall Albuquerque, NM

#### Finder



Please insert the disk: Ghosted Icon



People in multiuser environments sometimes eject floppy disks with Command-E or through a dialog box but forget to drag the ghosted icons of those disks into the Trash when they've finished. New users come along and eventually get asked for a disk they don't have.

When the Mac demands a disk you don't have, one way to continue working is to press Command-period (a reserved key combination that stops operations before they complete). Most of the time, this will eliminate the computer's "Please insert the disk" message, letting you continue working in peace.

David A. Zatz New York, NY

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### **Help Folder**

#### Answers to Readers' Questions

Is your Mac sick? Need a diagnosis? Leave it up to the doctor — Bob LeVitus. He's the author of Dr. Macintosh: Tips, Techniques and Advice on Mastering the Macintosh and the former editor-in-chief of MACazine. Now he's also the guy who answers your questions every month.

#### **⊠** Write to

Help Folder, c/o *MacUser* 950 Tower Lane, 18th Floor Foster City, CA 94404

#### Memory-Upgrade Options

Q. I have an SE with a 20-megabyte internal hard-disk drive and the original 1 megabyte of RAM. My question is this: If I want to increase my RAM now (to 4 megabytes) and later upgrade my logic board to the SE/30 with the 68030 chip, what kind of SIMMs should I buy?

#### David A. Toovy Oak Park, IL

A. There's been lots of confusion over what kinds of SIMMs can be used by which Macintosh models. A SIMM is a single in-line memory module, which is a bunch of little chips attached to a small circuit board (see "The Persistence of Memory," February '89, page 140, for more on SIMMs and how to install them).

When selecting SIMMs for your situation, you should consider two factors. The first is how the actual chip attaches to the board. The two methods are surface mount (low profile) and DIP (high profile). You want surface-mounted SIMMs, no matter which Mac model you own, because there's no longer a difference in price between the two (DIP SIMMs used to be somewhat cheaper); DIPs generate more heat; and DIPs are taller, which may interfere with the future installation of an internal harddisk drive or other peripheral.

The second factor is speed. RAM speed is measured in nanoseconds (nsec), which are billionths of a second. The factory-installed RAM in a stock Plus or SE runs at 150 nsec; the factory-installed RAM in a Mac II, IIx, IIcx, or SE/30 runs at 120 nsec; the factoryinstalled RAM in a IIci runs at 80 nsec; and the Macintosh Portable uses special lowpower-consumption SRAM (static RAM). The new Mac IIfx requires special G4-pin SIMMs, which run at 80 nsec but are not interchangeable with the SIMMs in the IIci.

All models can use RAM that is faster than what is factory-installed, but faster RAM doesn't make your machine run faster. You'd be well served to just buy whichever speed of SIMM is the least expensive. (Bear in mind, though, that you may want to take SIMMs with you later when you upgrade to a more powerful Mac.) Figure 1 shows the speeds that can be installed in each Mac model.

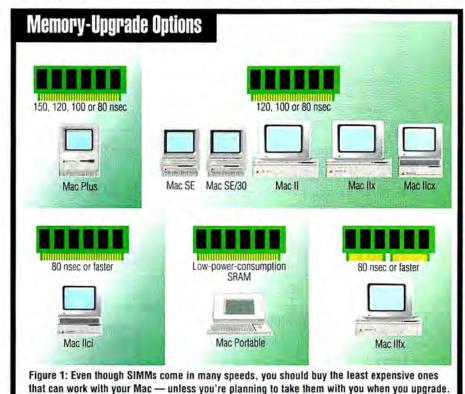
So, in answer to your question, you want surfacemounted SIMMs running at either 80, 100, or 120 nsec for your SE.

#### A Bug on the Clipboard

Q. I've found a bug in SuperPaint 2.0. I talked to the tech-support people at Silicon Beach Software about it, but they couldn't come up with a reasonable solution.

When graphics containing both text and drawings that came originally from SuperPaint 2.0 are copied from Word and pasted into the draw layer of SuperPaint 2.0, the text is placed out of alignment. My drawings are complex, and I don't have time to realign all the text elements every time I make a revision.

Experimenting further, I've come across some interesting anomalies. I've tried running Word 4.0, SuperPaint 2.0, and MacDraw 1.9 all at the same time under MultiFinder on my 2.5-megabyte Mac Plus running System 6.0.2. Then



#### By Bob LeVitus



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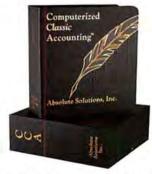
Ken Landis, MacUser



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when I draw a graphic containing lines and text in SuperPaint, copy it, paste it into Word, reselect it, copy it from Word, and paste it into SuperPaint, it comes out misaligned. But when I draw the same graphic in Super-Paint, copy it, paste it into Word, reselect it, copy it from Word and paste it into MacDraw, and then copy it from MacDraw and paste it into SuperPaint, it is aligned properly in both MacDraw and SuperPaint, but two extra pixels are added (you have to look closely to see them). So pasting the graphic from Word into MacDraw fixes the alignment but adds two spurious pixels.

Can you suggest a program that will let me edit these graphics in my Word files (which were originally created in SuperPaint 2.0), preserve the alignment of text and objects, and not add extra pixels?

#### Jim Frazier Palatine, IL

A. You've discovered an interesting bug in the Clipboard. Pasting a graphic originally created in SuperPaint 2.0 from Word 4.0 back into SuperPaint for editing does indeed mess up the alignment of text (see Figure 2). Pasting the same picture into MacDraw II 1.1 results in a picture that is properly aligned but has two extra pixel-sized objects. If you paste it into Canvas 2.1, Canvas 2.1 DA, or Drawing Table 1.0, the same thing happens - extra objects appear.

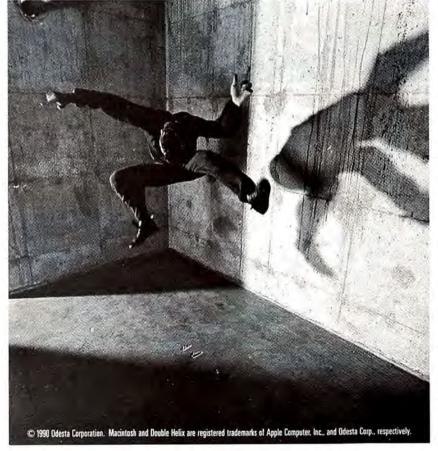
The only product I could find that was able to handle

the pasted graphic without adding a pixel or misaligning the text was DeskDraw, a MacDraw-like DA from Zedcor (4500 E. Speedway, Tucson, AZ 85712; [602] 881-8101). It's surprisingly robust for a DA; includes a

complete set of drawing tools; can flip, rotate, or align any object (including text); and can open PICT and SuperPaint 2.0 (although not version 1.0 or 1.1) files.

DeskDraw comes bundled with an excellent painting-

# This is the text that will become displaced when this picture is copied from SuperPaint 2.0, pasted into Word 4.0, then copied from Word and pasted into SuperPaint for revision... This is the text that will become displaced when this picture is copied from SuperPaint 2.0, pasted into Word 4.0, then copied from Word and pasted into SuperPaint for revision... Figure 2: A picture created in SuperPaint 2.0 is pasted into a Microsoft Word document (a), but when it's copied back to SuperPaint via the Clipboard (b), the text is misaligned.



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Apple Business, November 1989

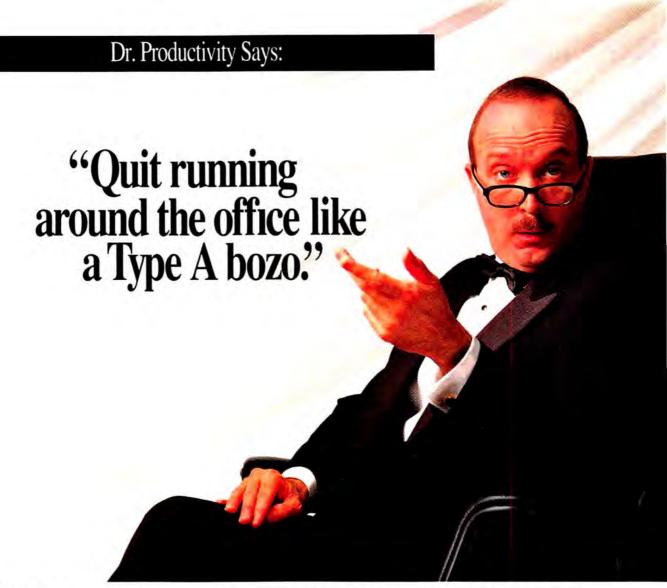
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program-in-a-DA that's called DeskPaint. At a list price of \$129.95 for the pair, they're both an excellent value and incredibly useful, especially if you have less than 2 megabytes of RAM. Even on my 5-megabyte Mac II, I find myself using them frequently—they have many of the features of my favorite drawing and painting programs, and because they're DAs, they open quickly and don't require much RAM.

#### **SCSI Chain of Tools**

Q. I've got several SCSI devices connected to my IIcx, but I don't always need them all. I'd like to be able to switch some of them off — but then I can't boot up the other drives. Is it possible to have several SCSI devices connected while keeping some of them

switched off?
Robert H. Fransen
Shenwood Bank Albert

Sherwood Park, Alberta Canada

A. The answer is "sometimes." It depends on how the device was manufactured. Most SCSI devices shut down the entire SCSI chain unless power is supplied to them. Some devices contain a diode that allows you to turn them off and still use other connected SCSI devices. Unfortunately, such devices are in the minority, and it's not a

feature that many manufacturers place high on their priority lists.

The only way to tell whether a device will shut down the SCSI chain when the power is off is to try it. If your device is like most,

#### **A Printing Calculator**

Q. I need a printing calculator on my Mac. This seems like a simple request, yet my Apple dealer and the large software companies I've contacted don't know of any software that does this.

E. Rogers Lexington, KY

A. Try SideKick: The Desktop Organizer, from Borland International (1800 Green Hills Road, Scotts Valley, CA 95066; [408] 438-8400). It's the Swiss army knife of DA packages. In addition to its multifunction printing calculator (see Figure 3), it includes outliner, phone-log, calendar, telecom, dialer, spreadsheet, and text-editing DAs.



Figure 3: SideKick's printing calculator DA is part of a complete package of DA utilities.



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though, you'll need to keep it turned on when you're using any of your SCSI devices.

#### **Extra Expansion Slots**

Q. I realize that my Macintosh SE has only one "expansion slot," but with the increasing number of expansion products coming out, I'm beginning to feel more and more discouraged by this limitation. Does any third-party manufacturer, or even Apple, produce anything like the Slotbuster that is available for the Apple II series?

Douglas Bitting St. Louis, MO

**A.** You're in luck. The ExpanSE, from Second Wave (9430 Research Blvd., Echelon II, Suite 260, Austin, TX 78759; [512] 343-9661), is an expansion chassis for the Mac

SE. The ExpanSE interface card goes into your Mac SE's internal slot and connects to a box that can hold up to four

additional SE cards.

The company also markets versions that let you add slots to the Plus (up to four SE cards), the Portable (up to two SE cards), and the Mac II family (up to eight NuBus cards).

#### **Scratched Monitor**

Q. I have an Apple 13-inch RGB color monitor that I just love. I recently scratched the glass badly, which has made viewing the screen painful to the eyes and looks terrible to boot. I've discovered that what's been scratched is the screen's antiglare coating and not the glass

I've called around to various places to find out how to fix this rather serious problem, and all I've heard is that they will replace the CRT for \$170! Isn't there a more

practical, and less expensive, way to remedy this?

Paul Macchia

Washington, DC

**A.** Sorry, the coating is fused to the glass, so replacing the tube is the only way to get rid of the scratches.

Speaking of monitors, antiglare coatings, and scratches: Don't forget that your Mac screen is extremely susceptible to

inadvertent damage. Never use glass cleaner on it or touch it with anything but a very soft cloth. Better still, use a commercial CRT cleaning product designed specifically for use on computer monitors.

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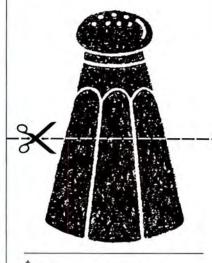


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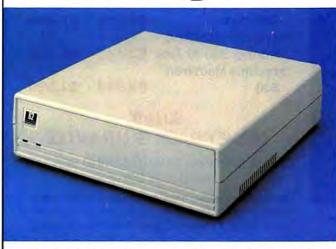


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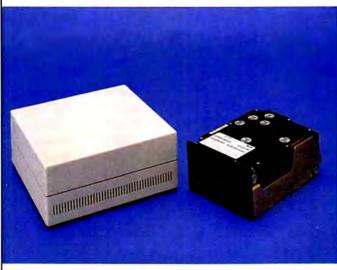






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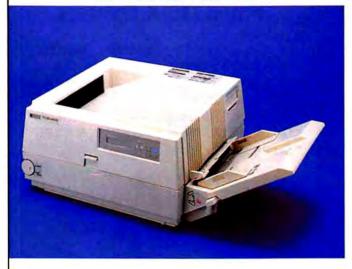
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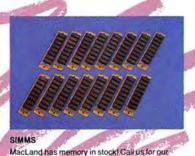
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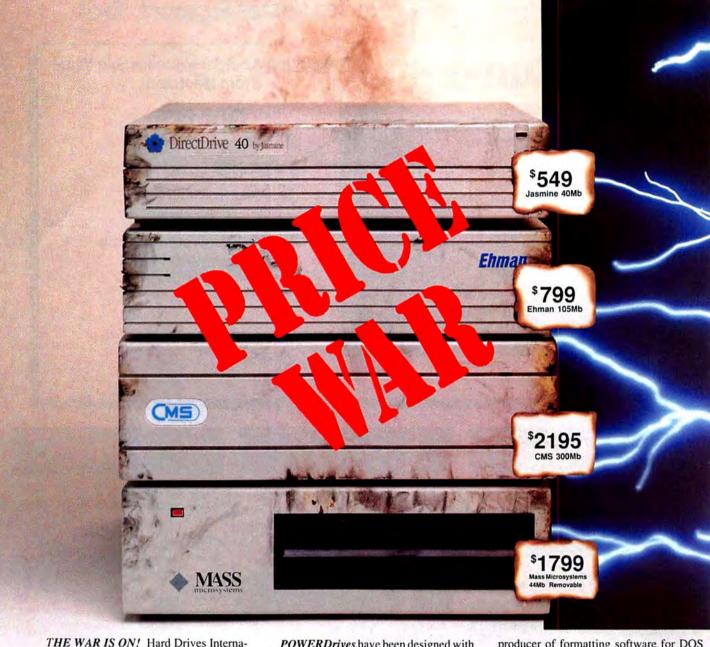
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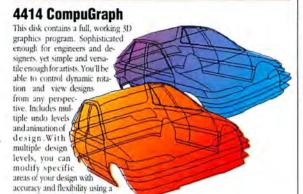


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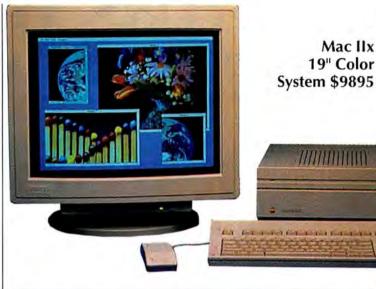
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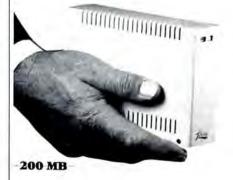
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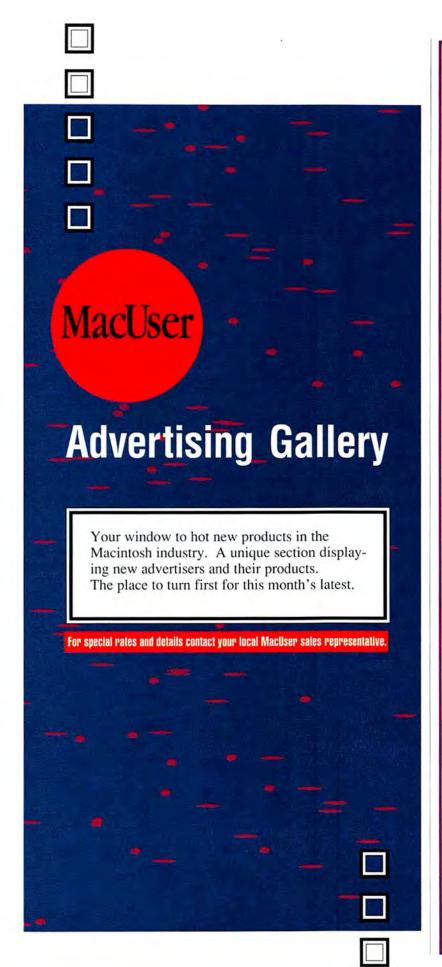
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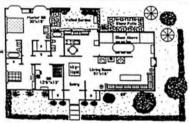
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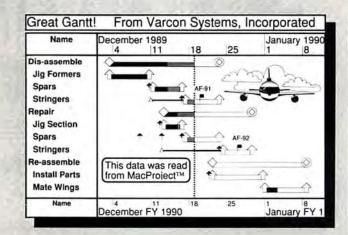
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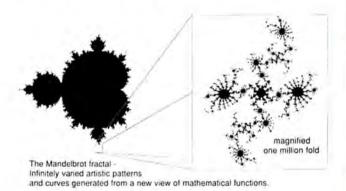
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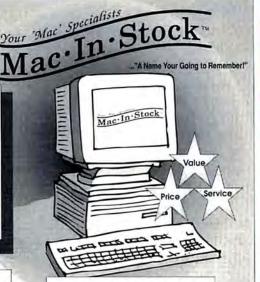
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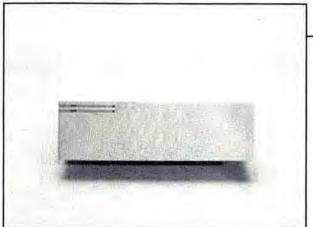
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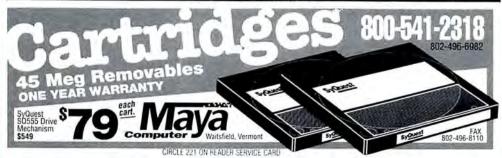
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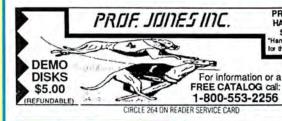
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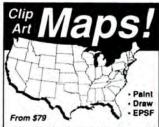
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pple has a reputation for innovation, but is that what the company really does best? Here's an annotated time line of the major Apple announcements since the company's inception. I've included how each machine scored on my own ten-point innovation index.

July 1976 - Apple I kit computer. A poorly laid-out motherboard and a bag of parts were all there was to this thing, now an incredible collector's item. Innovation rating: 7.

April 1977 — Apple II. Mike Markkula came along, and the company was organized to make something that would attract attention. It did, at the first West Coast Computer Faire, in San Francisco. Actually, the Apple II was nothing more than

# Linear Thinking

a redesigned Apple I in a pretty case. Innovation rating: 0.

June 1979 — Apple II+. More than two years had passed, with Apple's having done little more than adding a disk drive to the line of computers. Then, finally, this upgrade to the Apple II. Innovation rating: 0.

September 1980 - Apple III. Although detachable keyboards had been de rigueur for the whole year, Apple came out with a machine with a fixed keyboard that did little more than what could be done with an Apple II. Amid much hype, a new operating system, a practical hard disk, and extra memory were kludged onto the 6502 chip, which was hopelessly passé by this time. Innovation rating: 2.

January 1983 — Lisa and Apple IIe. In the first of many public-announcement blowout parties orchestrated by Steve Jobs, the company rolled out the much ballyhooed Lisa computer, equipped with an oddball disk drive, and the He upgrade to the Apple II line. Two and a half years had passed since the last major Apple announcement. Apple He innovation rating: 2. Lisa innovation rating: 8. The innovation rating could have been 10, but most of the ideas were lifted from the sluggish Xerox STAR.

December 1983 - Apple III+. Now an incredible collector's item. The company had to get this announcement out of the way in December, without fanfare, so as not to risk jinxing the upcoming Macintosh rollout. Innovation rating: 0.

January 1984 — 128K Macintosh. With great fanfare, Steve Jobs made this machine an instant classic, even thoughwith its slow disk, inadequate memory, and slow I/O port was completely unusable. The idea was good - but it was merely a remake of the Lisa. Innovation rating: 0.

April 1984 — Apple IIc. In a love fest called "Apple II Forever," the company rolled out the Apple IIc. Obviously the Apple II division felt it was getting short-sheeted by the attention given to the Mac. Nobody ever mentioned to the division that it was coasting and hadn't done anything important since 1976. Innovation rating: 1.

September 1984 - Mac 512K. The company rolled out this Mac under pressure from developers and Mac owners who had been forced to struggle with the inadequate 128K machine. This one was the stepping-stone to stardom for the computer but was hardly innovative. Innovation rating: 0.

January 1985 - Lisa renamed Mac/XL. In a desperation move, the company installed Mac drives and hoped upon hope to keep the Lisa alive. It died a miserable death shortly thereafter. Innovation rating: -1.

January 1986 — Mac Plus. Two years had passed since the Mac was introduced. The Japanese can turn around car designs faster than this. But, finally, a Mac that really addressed the needs of users. Faster ports, easier setup, more memory. Innovation rating: 3.

September 1986 - Apple IIGs. A yawner, if there ever was one. Innovation rating: 2.

March 1987 - Mac SE and Mac II. The Mac finally evolves into a nifty machine with a built-in hard disk. The Mac II, meanwhile, breaks, for the first time, the Mac's closed architecture and adds NuBus compatibility and color. Mac SE innovation rating: 3. Mac II innovation rating: 7.

August 1987 - HyperCard. Hard up for publicity, the company knows it has nothing in the works for at least another year and that what's coming is minor. So it hypes HyperCard. No innovation rating given.

September 1988 — Mac IIx and Apple IIc+. Two new directions for Apple: (1) minor speed upgrades and (2) inexplicable Mac naming conventions that make the computer name sound as if it had been devised by BMW. The Apple IIc+: What's the point? Both machines' innovation rating: 0.

January 1989 — Mac SE/30. It should have been named the "SE/x" (for a variety of reasons). The SE/30 moniker confuses everyone who thinks that the "30" refers to hard-disk capacity. A true marketing blunder, Adding a 68030 and nifty sound was cool, though. Innovation: 3.

March 1989 - Mac Ilcx. And ever onward. Innovation rating: 0.

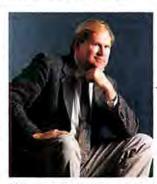
September 1989 - Mac Ilci and Mac Portable. The

Hei is a small-footprint box, kinda cute, with a slot for a speedup cache. With the Mac Portable, Apple finishes dead last in the race to make portables. Great screen, though. Mac Hei innovation rating: 4. Mac Portable innovation rating: 3.

March 1990 - Mac Ilfx. A real speed-demon. Apple adds a little RISC and a lot of price to the picture. One is a good idea; the other isn't. Innovation rating: 4.

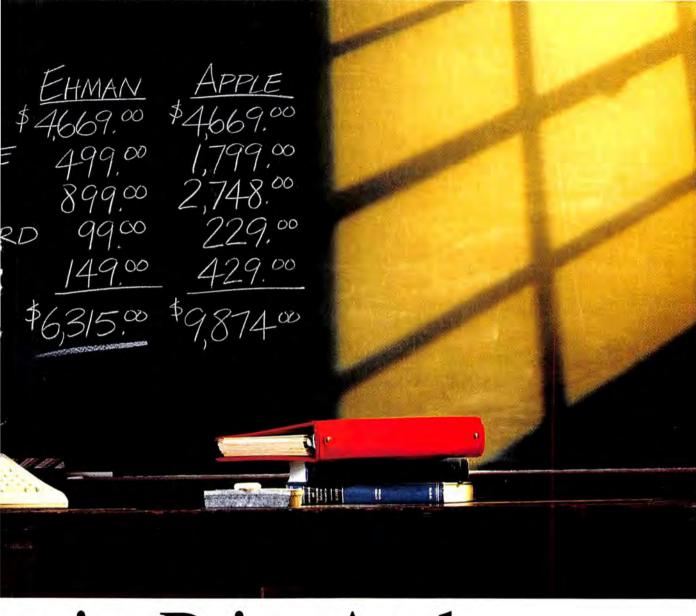
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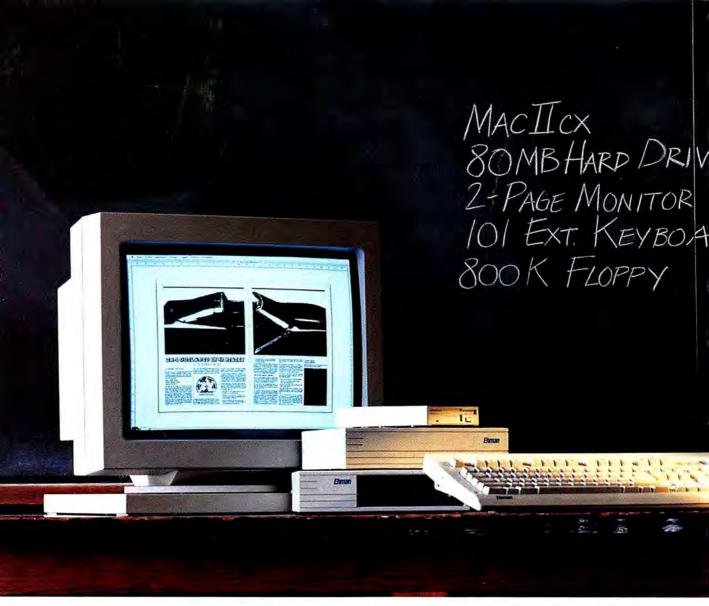
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